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ADENOMYOMA OF THE RECTOVAGINAL SEPTUM *

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In 1914, I referred[1] to two cases of adenomyoma of the rectovaginal septum recently reported by Cuthbert Lockyer,[2] and mentioned observations made by Macnaughton-Jones, Clifford White and Herbert Spencer. I also briefly mentioned two cases that Dr. D. S. D. Jessup of New York had observed and which he was about to publish.

Since then Jessup[3] has reported his cases in full. I have reported another case.[4] Stevens[5] reports five cases of adenomyoma that he observed in the course of eighteen months. He also refers to a case which he had accurately described in 1910.

Pierre Nadal,[6] of Bordeaux, reported a case of adenomyoma of the posterior vaginal wall in 1911. Other cases may have been recorded, but a careful survey of the literature in the *Index Medicus* for the last years failed to yield me more data on this subject.

I shall briefly refer to two other cases that have come under my personal observation and shall then try to sketch the course of adenomyoma of the rectovaginal septum as evidenced by the cases thus far reported. I shall also endeavor to indicate the appropriate methods of treating such tumors.

CASE 4.—*Adenomyoma of the rectovaginal septum extending out to the right pelvic wall and constricting some of the pelvic nerves; hysterectomy; recovery.*

Dec. 28, 1914, Dr. John Calvin Huckins of Ashland, N. H., wrote me as follows: "In THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION under date of March 14, 1914, I saw a report of a few cases of adenomyoma of the rectovaginal septum. On May 10, 1913, I had a patient with a small tumor in the rectovaginal septum. The mucous membrane of the right vaginal fornix had a bluish color and the mucosa was puckered. High up in the right vaginal fornix a small hard mass could be felt. Upon rectal examination, there was some bulging of the anterior rectal wall, and the mass could be made out more distinctly by a finger in the rectum. What the mass was I do not know. I had two surgeons in consultation, neither of whom knew what the growth was, or where it had originated. Dr. A. H. Harriman and I did an exploratory operation through the posterior vaginal wall and removed two thirds of the tumor, but we were of the opinion that it was malignant and did not complete the operation. When I read your article ten months later, I then knew what this tumor must have been. I took pains to keep track of this woman and for over a year I could not detect any lump upon digital examination. Only a few days ago, on rectal examination, was I able to find a small lump which seemed to be nearly as large as the one found at the time of our exploratory operation (about the size of a small hen's egg)."

Under date of Dec. 31, 1914, Dr. Huckins says: "This case seems to me to be identical with Lockyer's Case 2, only not quite as marked. I am of the opinion that the growth is connected with the uterus and broad ligament."

The patient, Mrs. O. P. S., aged 43, was admitted to the Johns Hopkins Hospital, Jan. 18, 1915. She had had no children. Her chief complaint was pelvic pain. The present illness had begun about three years before. At that time she had been for a long ride in a buggy over a rough country road. On her return home she had been taken with severe pain in the lower part of the pelvis and a feeling of pressure in the rectum. These symptoms had persisted for a few days and then disappeared. The following month, just after the menstrual flow had ceased, she had again experienced this peculiar grinding pain in the lower part of the pelvis. It had lasted for four or five days and then suddenly had disappeared. This pain had continued each month after the cessation of the menstrual flow. The discomfort would last from four to five days, and then until the following month she would be perfectly well. She said that the character of these pains was unusual. They were difficult to describe. They were more like a dull aching or grinding which, although not severe, was very annoying and when present made her very nervous. The pain was most severe at night and seemed more pronounced when she was on her feet. It was usually localized in one spot, but at times would radiate down the right leg.

The menstrual history was unimportant except for the fact that on two occasions during the past summer the flow had been profuse and prolonged to from eight to ten days. The bowels had been somewhat constipated; there had been no pain on defecation, and no history of bloody stools at any time.

On pelvic examination under anesthesia I found the uterus normal in size, slightly retroverted. No thickening could be made out on either side.

In the right vaginal vault and almost glued down to the lateral pelvic wall was a hard indurated mass, apparently about 3 cm. long and 2 cm. broad (Fig. 1). It felt distinctly nodular, and reminded one somewhat of an adenomyoma. I made a median incision and did a complete hysterectomy, but saved both tubes and ovaries. On the left side I kept close to the cervix. On the right side we dissected out the ureter and, after removal of the uterus, separated the rectum from the vagina for a distance of several centimeters, and then cleared the right broad ligament. The mass in question was about 3 cm. long and densely adherent to the side of the rectum, to the posterior vaginal wall, and also to the lateral

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* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery, at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Cullen, Thomas S.: Adenomyoma of the Rectovaginal Septum, THE JOURNAL A. M. A., March 14, 1914, p. 835.
2. Lockyer, Cuthbert: Proc. Roy. Soc. Med., 1913, vi, No. 4.
3. Jessup, D. S. D.: Adenomyoma of the Rectovaginal Septum, THE JOURNAL A. M. A., Aug. 1, 1914, p. 385.
4. Cullen, T. S.: Surg., Gynec. and Obst., March, 1915, p. 263.
5. Stevens, T. G.: Adenomyoma of the Rectovaginal Septum, Proc. Roy. Soc. Med., 1916, ix, Obst. and Gynec. Section, p. 1.
6. Nadal, Pierre: Bull. de l'Assn. franç. pour l'étude du cancer, 1911, iv, 338.

wall of the pelvis. It really had to be dug out. When loosened, it was still found attached to the rectum. It was removed. The pelvic peritoneum was brought together; a cigaret drain was laid in the pelvis and carried out through the vagina. The abdomen was closed. The patient made a perfectly satisfactory recovery.

Gyn.-Path. No. 20828: Sections from the nodule show that it is composed of bundles of nonstriped muscle, of fibrous tissue, and of a moderate amount of adipose tissue. Scattered throughout the tumor is uterine mucosa. Sometimes glands can be seen lying in direct contact with the muscle. At other points two or three glands are embedded in a characteristic stroma (Figure 2). Here and there is a slight tendency toward the formation of a miniature uterine cavity. The glands are lined with one layer of cylindric epithelium. The stroma is identical with that usually found surrounding the glands of the endometrium. Here and there the stroma is rarefied. At other points it shows a moderate degree of hemorrhage. Scattered here and there throughout the tumor are brownish or yellowish-brown masses of pigment, the remains of old hemorrhage. The outlying portions of the tumor are particularly instructive. The adipose tissue of the broad ligament is being gradually replaced first of all by small round cells, the fat cells looking like vacuoles in a mass of small round cells. In other places the tissue is in part or in its entirety replaced by connective tissue and here and there, as indicated in Figure 3, muscle and connective tissues are enveloping the nerves, thus in a measure accounting for the pain that the patient has had on the right side and which had extended down the right leg. The tumor is an adenomyoma of the type usually found in the rectovaginal septum, and in parts cannot be differentiated from an adenomyoma of the uterine wall.

Case 5.—*Adenomyoma of the rectovaginal septum.*

Miss J., aged 38, was referred to me by Dr. Alfred Whitehead, Jan. 8, 1910. For several months she had been complaining of pain in the lower abdomen, chiefly in the region of the rectum. For three months she had been growing weaker and for the last three weeks had been confined to bed. Her periods were excessive.

On pelvic examination I found, behind the uterus, a somewhat irregular mass, apparently 5 or 6 cm. in diameter. The thickening could be much more easily outlined through the rectum than through the vagina. Her pain at the menstrual period was so severe that I advised her removal to the Johns Hopkins Hospital.

Operation was performed Jan. 10, 1910. On opening the abdomen I found a myoma, 1 cm. in diameter, on the left side of the fundus. This was removed. The mass very low down behind the uterus seemed to be due to an inflammatory thickening between the cervix posteriorly and the rectum (Figure 4). The rectum at this point was drawn up and adherent to the back of the cervix. After the cervix had been separated from the rectum, the area of thickening was found to extend backward and to implicate part of the left uterosacral ligament. Although the surface of the rectum was thickened over an area 2 by 3 cm., the lumen of the bowel was in no way encroached on.

To have removed satisfactorily the area of thickening in the rectum would have necessitated, as a preliminary, a complete hysterectomy. This we were very anxious to avoid, as the patient was engaged, and hoped soon to be married. As the growth in no way suggested cancer or tuberculosis, we laid a drain in the pelvis, bringing it out through the vagina in such a manner that it separated the raw area of the bowel from the raw area on the back of the cervix.

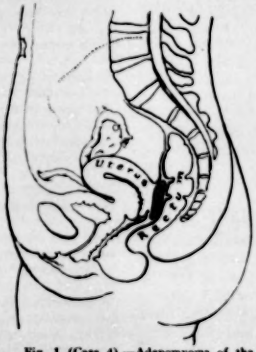

Fig. 1 (Case 4).—Adenomyoma of the rectovaginal septum. The black area posterior to the cervix indicates the location of the growth noted in Case 4. It had encroached on the right vaginal vault and at operation was found to have extended as far as the pelvic wall on the right. To this it was densely adherent.

The patient made a good recovery. I saw her again at her home, Feb. 28, 1910. At the menstrual period following her dismissal from the hospital she had terrific rectal pain. This persisted, and I again examined her under anesthesia and found the supposed inflammatory thickening in the vaginal vault just as marked as before the abdominal operation. I opened up the old drainage tract in the vaginal vault and found that the area of thickening in the bowel had folded over on itself. After straightening out the fold I again drained through the vagina. We thought the kinking of the rectum might possibly have caused the severe pain. Complete removal of the uterus followed by removal of the rectal thickening was again considered but, on account of the contemplated marriage, it was thought wiser to continue palliative measures for a time at least. During my absence, in the summer of 1910, she came under the care of Dr. E. H. Richardson, and to him I am indebted for the further clinical notes on the case. As her symptoms still persisted, in October, 1910, Dr. Richardson dilated and curetted, removing a large amount of endometrium. After this the patient improved for several months, although she was never free from menstrual pains, which were referred to the left hip and to the left iliac fossa. She was practically an invalid for three weeks out of every month. Nov. 1, 1911, Dr. Richardson did a supravaginal hysterectomy, releasing extensive pelvic adhesions, removing at the same time the left tube and ovary, and resecting the right ovary. Enough of the uterus was left to allow the patient to menstruate. Then the operator encountered dense pelvic adhesions. The cervix was firmly fixed to the rectum, and a mass, several centimeters in diameter, was found at this point. The patient's condition was such that resection of the rectum could not be undertaken. Her convalescence was a stormy one and she was afterward kept on a rest cure for four weeks. She improved markedly so far as her general condition was concerned, but from the first menstrual period after operation she complained of the same pain as before; it was, however, less severe. Finally, she again became an invalid for three weeks out of each month. Her condition remained about the same.

In July, 1912, the patient was suffering so intensely and so constantly that another thorough pelvic examination was made. At this time there was a marked increase in the size of the "inflammatory mass" in the rectovaginal septum. She was admitted to the Johns Hopkins Hospital Aug. 7, 1912. At that time she was poorly nourished. The abdomen was opened, and numerous omental adhesions were found everywhere. After dissecting out the right ovary, the stump of the cervix was reached with a great deal of difficulty. The rectum was now gradually dissected free and the "inflammatory mass" was exposed. This, Dr. Richardson tells me, was situated about 4 cm. from the anus; it implicated the anterior surface of the bowel and extended out laterally. The mass was about the size of a small hen's egg. The portion of the rectum containing the tumor was resected and the bowel drawn down and attached to the anal margin. The patient stood the early part of the operation very well, but near the close her pulse became almost imperceptible. She did not rally and died ten hours later from surgical shock.

Gyn.-Path. No. 18756: Sections from the tumor show that it is composed of nonstriped muscle and fibrous tissue, with islands of uterine mucosa scattered freely throughout it (Figure 5). Some of these islands contain only one or two glands; in other sections there are eight or ten. The glands occasionally lie in direct contact with the muscle, but nearly all of them are embedded in stroma. The gland epithelium

is thicker than usual and corresponds to the type that we speak of as hyperplasia, being two or three times the normal thickness. The stroma surrounding the glands is also exceptionally abundant. A good many of the glands are dilated and some are evidently cystic. Even in the dilated glands the epithelium is much thicker than usual. The picture is that of a typical adenomyoma. The glands in the myoma encroach more on the rectal wall than usual (Figure 6).

Fig. 2 (Case 4).—Adenomyoma of the rectovaginal septum. In this case the growth had invaded the right broad ligament, and extended out to the pelvic wall, so that it was necessary literally to dig the growth away from the side of the pelvis. In the lower part of the section two or three glands are seen. The dark areas surrounding them are the characteristic stroma of the uterine mucosa. In the left portion of the section it will be noted that the adipose tissue is being replaced by fibrous tissue and muscle. The condition was diagnosed clinically by Dr. Huckins, the family physician.

In a few places they have penetrated the muscle and at one point at least they have broken through the muscle and lie in direct contact with the rectal glands (Figure 7). One gland is seen projecting down nearly half way through the rectal mucosa. Such an intimate blending of uterine mucosa with rectal mucous membrane I have never seen before. To have shelled this growth out or to have cut it away without removing a segment of the rectum would have been an utter impossibility.

DESCRIPTION OF ADENOMYOMAS OF THE RECTO-VAGINAL SEPTUM

Myomas occurring in the septum between the vagina and the rectum have long been known, and some of them have reached such a size that they encroach markedly both on the vagina and on the rectum. In the male, so-called rectal myomas have been noted. In one case the tumor was as large as a coconut and at first was thought to be an inoperable malignant growth. The short but comprehensive article on the subject by F. Descoeudres[7] is well worth a thorough study.

From the cases of adenomyoma of the rectovaginal septum that I have been able to collect, the following tentative classification may be made:

1. Small adenomyomas lying relatively free in the rectovaginal septum (Cullen's Case, 1, Stevens' Case 1, Stevens' Case 5, Nadal's case).

2. Adenomyomas adherent to the posterior surface of the cervix and at the same time to the anterior surface of the rectum (Lockyer's Case 2, Cullen's Case 3, Stevens' Cases 2, 3, 4 and 6, Jessup's Cases 1 and 2).

3. Adenomyomas gluing the cervix and rectum together and spreading out into one or both broad ligaments (Cullen's Case 4, Cullen's and Richardson's Case 5).

4. Adenomyomas involving the posterior surface of the cervix, the rectum and broad ligaments, and forming a dense pelvic mass that cannot be liberated (Cullen's Case 2).

Of course, one group merges imperceptibly into another, and a case which today belongs to Group 1 may in a few years belong to Group 2 or to Group 3.

On vaginal examination one can detect a definite thickening. This may be situated in the posterior wall to the right or left of the cervix, but is usually directly behind it. It may vary from 1 to 3 or 4 cm. in breadth. The thickening is occasionally nodular. As a rule, however, it is diffuse, hard, and reminds one of dense inflammatory tissue or of a small adherent myoma. In some cases the nodule moves with the cervix, as if the two made up a single piece. In other cases the nodule also seems firmly fixed to the rectum.

In a few cases the vaginal mucosa over the nodule has been puckered and is of a bluish tinge. This was noted in Lockyer's Case 2, and in my Case 4. In Stevens' Case 2 the overlying vaginal mucosa was also puckered. The puckering is due to the tumor becoming adherent to the vaginal mucosa.

In those cases in which the growth has invaded all parts of the pelvic floor, one finds induration throughout the vaginal vault. There may also be a slightly cystic feel on bimanual examination, if some of the glands or a miniature uterine cavity in the tumor have filled up with blood. This was observed in my Case 2.

On rectal examination, these tumors, if situated directly behind the cervix, can often be more clearly felt than through the vagina. If the growth be adherent to the rectum, the bowel over this area is splinted and hard, and does not yield. The rectal mucosa, however, even over the growth, is, as a rule, perfectly normal, although the tumor may project slightly into the lumen of the bowel. In my Case 3 the growth had partly encircled the bowel and had produced a considerable degree of narrowing of the lumen. In

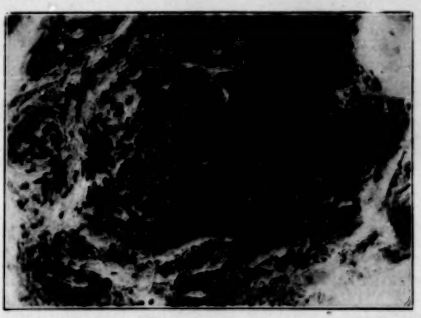

Fig. 3 (Case 4).—Muscular and fibrous tissue in an adenomyoma of the broad ligament encircling and compressing nerves. This section is from the right broad ligament. It shows the diffuse myomatous and fibrous tissue surrounding nerves. There were definite symptoms of nerve pressure.

Jessup's Case 2 the patient had had hemorrhoids for thirteen years, and in my Case 1, in which a discrete myoma, 4 cm. in diameter, was encroaching on the lumen of the bowel, the rectal mucosa at this point showed several small polypi projecting from it. These Dr. Samuel T. Earle removed prior to my doing the hysterectomy.

7. Descoeudres, F.: Des myomes du rectum, Rev. de gynéc. et de chir. abd., 1910, xiv, 5.

HISTOLOGIC APPEARANCES

These growths, whether large or small, discrete or diffuse, consist of nonstriped muscle and fibrous tissue, and have scattered throughout them typical uterine glands. These glands may occur singly and lie in direct contact with the muscle, or may be found in groups. As a rule, they are separated from the muscle or fibrous tissue by the characteristic stroma of the uterine mucosa, and at many points one can see islands of stroma devoid of glands. In some of the glands fresh blood may be found. More frequently, yellowish-brown pigment is noted in clumps scattered throughout the stroma. This pigment is the remnant of old bleeding.

Along the advancing margin of the diffuse growth, the manner in which the growth extends can sometimes be very clearly followed. This was well shown in my Case 4 (Fig. 2). Here the young connective tissue cells and the muscle fibers gradually replace the adipose tissue of the broad ligament, and finally engulf it completely. They encircle nerves and gradually compress them, thus adding to the discomfort of the patient.

The most widespread growth that I know of was found in my Case 2. In this case a hysterectomy had been performed in San Francisco two years before. When I saw the patient, the lower portion of the pelvis was filled with an adenomyomatous growth. The mass in the left side proved to be a miniature uterine cavity filled with chocolate colored fluid — the residue of the retained menstrual flow.

Histologically these growths are identical with adenomyomas of the uterus.

SYMPTOMS

Age Incidence.—The ages were as follows, 25, 30, 32, 35, 37, 37, 38, 41, 41, 41, 42, 43 and 53. The 53 year old patient still menstruated slightly. She told me that members of her family did not reach the menopause until somewhat late, and that her great uncle was born when his mother was 54. All of the cases occurred among women who were still menstruating.

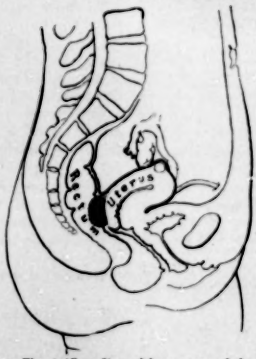

Fig. 4 (Case 5). — Adenomyoma of the rectovaginal septum. The black area between the cervix and rectum indicates the location and approximate size of the supposed inflammatory thickening noted at operation in Case 5. A reference to the description of the specimen shows that the mass was a typical adenomyoma. In the fundus of the uterus was a small myoma.

Menstruation.—The most pronounced symptom was profuse menstruation. In some this was painless, in others accompanied by great discomfort. My patient, in Case 2, was almost exsanguinated, although a supravaginal hysterectomy had been done for removal of a myoma two years before. In my Case 3 the patient had insufferable pain for two days before and after each period. In my Case 4, in which we found the adenomyoma gripping small pelvic nerves on the right, the pain at the period was always on the right side; it also extended to the right hip. Partial removal of the growth relieved her of these pains for from six to eight months. In my Case 5 the pain at the period was very severe, and the patient was finally incapacitated for three out of the four weeks.

Rectal pain was also a prominent feature in some cases. In Lockyer's Case 2 there was great pain in the rectum, and defecation was difficult. The patient said that something prevented the bowel from moving. The discomfort was more severe at night. In my Case 3, the patient had had for the last two months six bowel movements daily. The discomfort was so severe that she insisted on having something done. It was in this case that we found much narrowing of the lumen of the bowel. In my Case 4 the woman was slightly constipated. Before her first operation defecation had been invariably accompanied by pain. In my Case 5 there was pain in the lower abdomen, chiefly in the rectum.

When the growth is small, is not adherent to the rectum and has not spread out into the broad ligament so that it has commenced to exert pressure, we shall expect few if any symptoms. In those cases, however, in which the adenomyoma has become adherent to the rectum, there is a tendency to pain in the rectum, with or without painful defecation.

When the growth has invaded the broad ligament and encroached on the nerves, we may expect discomfort referable to this region, due in the first place to the pressure on the nerves, and in the second place to the swelling of the tumor at the menstrual period. Profuse periods seem to be the rule.

CAUSE OF ADENOMYOMA OF THE RECTOVAGINAL SEPTUM

Our knowledge of the distribution of adenomyoma is becoming more stable each year. Adenomyomas of the uterus, formerly thought to be rare, are relatively common.[8] The source of origin of their glands is also clear, namely, from the uterine mucosa. We know that adenomyomas may be found in the round ligament,[9] in small umbilical tumors,[10] in the utero-ovarian ligament,[11] and recently one has been described as occurring in the broad ligament over the left ureter.[12] My colleague, Dr. William W. Russell,[13] has found uterine mucosa in the hilum of the ovary.

When discussing cervical adenomyomas, in my work on "Adenomyoma of the Uterus," several years ago, I pictured an island of perfectly normal mucosa of the body of the uterus situated near the outer surface of the cervix.[14]

Subsequent studies may possibly show that this is no great rarity. If so, this growth might readily become the starting point for those adenomyomas found in the rectovaginal septum.

Krönig, Hartz and Breus have reported cases that may be of interest in this connection.

8. Cullen, Thomas S.: Adenomyoma of the Uterus, Philadelphia, W. B. Saunders Company, 1908.
9. Cullen, Thomas S.: Adenomyoma of the Round Ligament, Johns Hopkins Hospital Bull., May and June, 1896.
10. Cullen, Thomas S.: Diseases of the Umbilicus, Philadelphia, W. B. Saunders Company, 1916, p. 373.
11. Cullen, Thomas S.: Adenomyoma of the Uterus, Figure 41, p. 142.
12. Stickney, G. L.: A Case of Diffuse Adenomyoma of the Uterus with Discrete Adenomyoma over the Left Ureter, Johns Hopkins Hospital Bull., 1915, xxvi, 304.
13. Russell, William W.: Aberrant Portions of the Müllerian Duct Found in an Ovary, Johns Hopkins Hosp. Bull., 1899, x, 8.
14. Cullen, Thomas S.: Adenomyoma of the Uterus, Figure 49, p. 169.

Krönig[15] reports a very interesting instance of a cystic adenomyoma springing from the posterior wall of the uterus and extending backward beneath the peritoneum of Douglas' pouch. It consisted of one large thin-walled cyst containing a liter of brownish-red fluid, and of a more solid portion consisting of about thirty small spaces so arranged that they

Fig. 5 (Case 5).—Adenomyoma of the rectovaginal septum. The matrix of the tumor consists of nonstriped muscle and of fibrous tissue. The round colony of glands on the right is composed of typical uterine glands. They are surrounded by the characteristic stroma of the mucosa. The large glands in the center and also those on the left have a thicker epithelium than usual. They look exactly like those noted in hyperplasia of the endometrium. They also are partially embedded in stroma similar to that of the endometrium. (Photomicrograph by Herman Schapiro.)

resembled a honeycomb. The walls of the large cyst, especially of that portion lying free in the abdominal cavity, were very thin, in places measuring scarcely more than 1 mm. The cyst walls were composed of fibrous tissue and of a varying amount of muscle. The inner surface was in places lined with cylindric ciliated epithelium. The more solid portion of the tumor was a typical cystic adenomyoma, which, as Krönig says, in the form and arrangement of glands and in the cystic spaces, corresponded in practically all points with the adenomyomas of von Recklinghausen. There were definite groups of glands surrounded by the characteristic stroma. Krönig thinks that the tumor originated in the uterine wall and was later pushed out into the connective tissue of Douglas' pouch.

Hartz[16] observed a similar case in Sänger's clinic.

In Breus'[17] Case 2 the patient was 51 years of age. There was a tumor, the size of a child's head, springing from the posterior surface of the uterus and covered by the peritoneum of Douglas' sac and the left broad ligament. The tumor, on its upper and posterior surface, was hard. On section it was seen to be composed of myomatous tissue, but the central portion contained several cavities. These varied from a pea to an apple in size, and were in part separated from one another by thick partitions. Several of them, however, communicated with one another. The cysts had smooth inner surfaces and were filled with a thick chocolate-brown fluid. The largest cyst communicated directly with the uterine cavity by a funnel-shaped opening just above the internal os. The cysts were lined with cylindric ciliated epithelium, and, where the large cyst communicated with the uterine cavity, the surface epithelium of the uterine mucosa was directly continuous with that of the cyst. Breus considered the tumor as a subperitoneal and intraligamentary cystic myoma of the uterus.

The glands in the adenomyomas of the rectovaginal septum look like, and act exactly like, those of the mucosa of the body of the uterus, and they undoubtedly arise from uterine glands or from remnants of Müller's duct.

DIFFERENTIAL DIAGNOSIS

As pointed out by Jessup, in both of his cases, in which the patients were operated on by Dr. William S. Bainbridge, other surgeons had diagnosed the growths as inoperable cancer. That was permissible in the past, but will not be in the future. These growths occur in women, are noted in the childbearing period, are usually situated directly behind the cervix and, as a rule, are firmly adherent to the rectum. The symptoms are excessive and painful periods, accompanied in severe cases by much rectal pain. On rectal examination the growth is found literally plastered to the anterior surface of the bowel. The rectal wall is fixed at that point, but its mucosa is intact, and is normal, or merely shows a few hemorrhoids or possibly a polyp. I know of nothing in pelvic or rectal surgery that should be confounded with this condition in future.

TREATMENT

Some might argue that simple removal of the appendages would cause atrophy of the uterine mucosa contained in the adenomyomas of the rectovaginal septum. My Case 2 is a sufficient answer. Although

Fig. 6 (Case 5).—Adenomyoma of the rectovaginal septum. The rectal mucosa is normal. Some of the glands of the adenomyoma are small and round; others are large. The large glands have a thickened epithelium and correspond to the characteristic picture noted in hyperplasia of the endometrium. Nearly all of the glands are surrounded by the characteristic stroma of the uterine mucosa. At the right limit of the section one of the uterine glands is lying in direct contact with the rectal mucosa. (Photomicrograph by Herman Schapiro.)

a supravaginal hysterectomy had been performed two years before for a myomatous uterus, the pelvic condition had grown steadily worse.

1. Where small discrete nodules exist in the posterior vaginal vault, these may be readily removed

15. Krönig, B.: Ein retroperitoneal gelegenes voluminöses Polycystom entstanden aus Resten des Wolff'schen Körpers, Beitr. z. Geburtsh. u. Gynäk., 1901, iv, 61.
16. Hartz, A.: Neuere Arbeiten über die mesonephrischen Geschwülste, Monatsschr. f. Geburtsh. u. Gynäk., xiii.
17. Breus, Carl: Ueber wahre epithelführende Cystenbildung in Uterusmyomen, Leipzig, 1894.

through a vaginal incision, as was so successfully done by Stevens.

2. Where the growth occupies the posterior surface of the cervix and extends laterally, after the ureters have been dissected out carefully, a complete abdominal hysterectomy should be performed.

3. If the growth be firmly adherent to the rectum, a wedge of the rectum should be removed, together with the uterus. It has been found best, after freeing the uterus on all sides, to open up the vagina anteriorly and laterally. The uterus and the rectum can then be lifted farther out of the pelvis, thus facilitating the removal of the necessary wedge of the anterior rectal wall. The uterus really acts as a handle, and the necessary rectal tissue and the uterus are removed as one piece.

4. Where the lumen of the bowel is greatly narrowed, a complete segment of the rectum should be removed with the uterus, and an anastomosis should be made.

5. In desperate cases, where everything in the pelvis is glued together, as in my Case 2, an ideal operation is out of the question. The patient will not stand a long operation, and, if she could, a satisfactory result could not be obtained. In such a case it would be better to cut across the sigmoid, invert the lower end, close it, and bring the upper end out through the abdominal wall of the left iliac fossa, making a permanent colostomy. When the patient has to some extent regained her strength, the uterus, the lower portion of the rectum and the broad ligament tissue can be shelled out as one piece.

These growths, while histologically not malignant, remind one of glue. Unless they are completely removed, further trouble is liable to occur.

The fact that Stevens has observed five cases of adenomyoma in eighteen months, and that I have had five cases in my own practice, leads me to believe that adenomyoma of the rectovaginal septum is no great rarity and that the literature of the near future will contain records of many such cases.

20 East Eager Street.

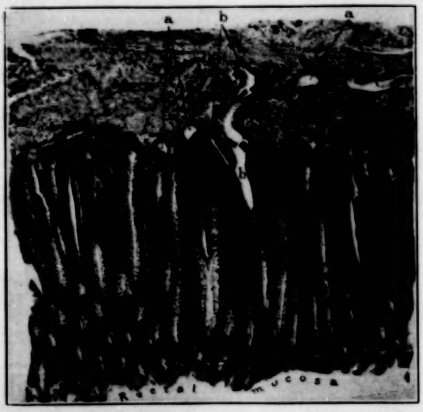

Fig. 7 (Case 5).—Glands of adenomyoma of the rectovaginal septum penetrating the rectal mucosa. The rectal mucosa looks normal. In the underlying muscle are a few uterine glands (*a*) lying in direct contact with the muscle. At *b* is a uterine gland extending down into the rectal mucosa. The continuity of this gland could be followed in other sections. This is the only instance known to us in which the glands of an adenomyoma have actually invaded the rectal mucosa. (Photomicrograph by Herman Schapiro.)

ABSTRACT OF DISCUSSION

Dr. Carey Culbertson, Chicago: At first thought one might be led to surmise that adenomyoma of the rectovaginal septum is a pathologic entity so rare as to be of little value. But when we realize that Cuthbert Lochyer's first case was reported as recently as 1913 and that already we have these five cases of Dr. Cullen's, with the six additional ones of Stevens', it can only mean that in all clinics of any considerable size these cases have been overlooked. In addition to his own cases, the first of which, by the way, Stevens claims he reported as far back as 1909, cases have been described in England by Spencer, Lietch, Gough and Stewart and Bland-Sutton. A. Mayer last November reported five cases of a peculiar tumor-forming inflammatory process in the tissues between the rectum and vagina which he places in the same category as R. Meyer's "posterior paravaginitis and parametritis with proliferation of epithelium," described in 1908. Aman recently described a case which he calls "retrocervical fibro-adenomatous serositis" and refers to five others, accepting Meyer's pathologic explanation and conclusions. An interesting point in the pathology of growths is that, with the exception of two of Stevens' cases, all were associated with inflammatory processes, the uterus usually being retroverted and densely adherent. This suggests at once the similar condition in the tubes, called by Robinowitz "adenomyosalpingitis," but which has also been regarded as a true neoplasm. It is not so difficult to understand how inflammatory pressure might produce such a squeezing out of the mucosa into the wall of the tube; but in the case of the rectovaginal septum or postcervical space, the distance from the uterine cavity is too great to admit of the presence here of typical uterine mucosa as the result of inflammatory pressure. Lack of time prevented Dr. Cullen from expressing his opinion as to the origin of these growths—whether he regards them as due to inflammatory pressure on the uterus, which seems to be the German idea, or as true neoplasms originating from embryonic rests persisting from the fusion of the müllerian ducts.

Dr. Thomas S. Cullen, Baltimore: I have had in all five cases of adenomyoma of the rectovaginal septum. When the first case came under my care I was ignorant of the fact that such a condition as adenomyoma of the rectovaginal septum ever existed, and it was only within the last five weeks, when looking over old specimens, that we found out the exact nature of the case. In our cases of adenomyoma of the rectovaginal septum there has been no indication whatever of inflammation, that is, of the pouring out of small round cells or polymorphonuclear leukocytes. There is, however, an inherent tendency for the mucosa and for the nonstriped muscle and connective tissue to spread out and invade surrounding structures. The glands in these cases undoubtedly originate from the uterine mucosa or from remains of Müller's duct. I feel confident that within the next few months more cases of adenomyoma of the rectovaginal septum will be reported.

Tapeworm in Portugal.—The *Medicina Contemporanea* states that the eggs of the *Hymenolepis nana*, the smallest tapeworm known, were found in thirty-three of 503 children at Lisbon whose stools were examined. From one to several hundred ova were found, and in nineteen cases they were associated with other helminths' ova. This is a proportion of 6.5 per cent.; Grassi found this parasite in the stools of 10 per cent. of the children in southern Italy that were examined, and it seems to be prevalent in Belgian miners and in Italian immigrants in Brazil. In the Lisbon cases, there did not seem to be any special symptoms from the presence of the parasite.

PETER PARKER, THE FOUNDER OF MODERN MEDICAL MISSIONS

A UNIQUE COLLECTION OF PAINTINGS *

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A few months ago occurred the laying of the corner stone of the hospital for the Yale Medical School in Changsha, China, a city of 300,000 in a province (Hunan) of 20,000,000 inhabitants. It is said that this will be the finest building of its kind in interior China. This notable work, now being done in China by Dr. Hume and Dr. Yen and their associates, is such a natural outgrowth of that begun there by another Yale man about eighty years ago that I have ventured to describe briefly the work of this earlier physician of the last century. His name was Peter Parker, and to him belongs the distinction of being the founder of modern medical missions. Fortunately there is an excellent biography of Dr. Parker, written by the Rev. George B. Stevens, D.D., "The Life, Letters and Journals of the Rev. and Honorable Peter Parker, M.D., Missionary, Physician and Diplomatist, the Father of Medical Missions and Founder of the Ophthalmic Hospital in Canton." The language of this title may seem extravagant, as that of the clergy is apt to be when speaking of matters medical. A study of the many things which Dr. Parker accomplished in various lines, however, convinces me that the entire title is fully deserved.

Fig. 2.—See case report No. 2.

Fig. 3.—See case report No. 2.

He was born in Framingham, Mass., June 8, 1804. From his boyhood on one is impressed by his intensely religious nature and his desire to exert an influence on others. His education was delayed because of the poverty of his home, and it was only in his twenty-second year, after making suitable arrangements for the care of his parents, that he was able to start out for a more liberal education. At 23 he entered Amherst College, where he remained three years. He evidently thought seriously of completing his college course at Harvard, but was advised by his ministerial friends that it was not desirable for pious students to go there at that time. He then decided to enter Yale for his senior year. One is impressed with the enormous amount of extracurriculum work, chiefly of a religious nature, which he carried that year. How early he decided to study medicine does not appear, although he evidently intended from his youth to go into the mission field. However, it is interesting to note what an excellent foundation for his medical studies was provided in this required course in the senior year in college. Of it he says:

> By anatomy I have been made acquainted with my own material system, the framework, the union of the several parts, and their requisite functions; whilst Locke, Stewart and Brown have rendered me acquainted with the mind, its occupant, and the mental powers and operations. Geology has made me acquainted with the awful history of my birthplace; chemistry, with the constitution of the various elements; botany, with the names and physiology of all the individuals of the vegetable kingdom which extends over no small portion of its surface; astronomy leads to an acquaintance, or contemplation at least, of the whole universe. Natural theology has pointed me to the proofs of an all-designing and infinite mind; and to complete the climax, the descent of the Holy Spirit has wonderfully displayed the riches of redeeming grace.[1]

He graduated from the college in 1831. In the following year, we find him as a student both in the divinity school and in the medical school at Yale.

His routine work at that time is outlined in a letter to his mother and sister, dated Nov. 25, 1831:

> You will better understand what I mean by unprecedented pressure of duties, if I enumerate some of them. I arise at half-past five in the morning, and attend prayers in the Seminary. From this until breakfast, at half-past six, study Hebrew or Greek. From eight to ten, again study Hebrew or Greek. From ten to eleven, attend Dr. Ives' lecture on the theory and practice of medicine. From eleven to twelve I am engaged in Miss Hotchkiss' school. From twelve to one, attend Dr. Knight's lecture on anatomy. From two to three p. m., a recitation to Professor Gibbs in Hebrew or Greek. From three to four I have a class in chemistry, or Paley's Theology, then one hour for exercises, and the remainder of the day for study and attending meetings. This is a fair outline of every day's employment; so you will not regard it as altogether strange that I have not written you before.[2]

Some of the examples of the manner in which he combined medical and religious work at this time are interesting. A woman had been murdered and her husband was suspected of the crime. As a medical student, Parker attended the necropsy on the body of the murdered woman, and then in his other field of labor hastened to the jail to pray with the wretched husband.

During the great epidemic of cholera in the summer and fall of 1832, he had an unusual opportunity as a

* Owing to lack of space, this article has been abbreviated in THE JOURNAL by the omission of several case reports and illustrations. The complete article will appear in the reprints, a copy of which can be obtained of the author on request.

1. Stevens, G. B.: Life of Peter Parker, p. 49.
2. Stevens, G. B.: Life of Peter Parker, p. 57.

medical student to do practical work among the poorer classes. After completing his courses in the divinity school and in the medical school and being publicly dedicated as a missionary to China at a great public meeting at the Bleeker Street Presbyterian Church in New York, he sailed for China, June 4, 1834. Early in life he formed the habit of keeping a journal or diary, and he had also developed to a large degree the old New England custom of introspection or self examination. As a result his journals frequently give us not only an account of his work but also his own estimate of himself and of his successes or failures. When only a week out from New York on his first trip to China, we find recorded this estimate of his undertaking, "I am among those who stand upon the pinnacle of the world, a spectacle to millions, both of the friends and enemies of Christ," and repeatedly there is found in his journals good evidence that he had no mean estimate of himself and his life work. After a voyage of 140 days he arrived in China. Without waiting to acquire any very extended knowledge of the language, he at once began the practice of medicine together with other missionary work. Thus in the following February he records, "It is now four o'clock in the afternoon. In the morning as usual attended the sick; at ten in the morning held divine service with about twenty-six Chinese, at the close of which I again attended the sick." Also, "As it respects my intercourse with the Chinese, and my medical and surgical practice among them it far excels all of which I ever thought." The time appeared to be ripe for this work, for while he was the forerunner of medical missionaries in that country, individual physicians in small numbers, particularly from England, had preceded him. Vaccination had already been introduced into China. Parker's first field was at Singapore, and as he plunged into his medical work with great zest we find him sorely distressed at his "declining spirituality," a condition in which perhaps he is not unique among medical men.

Fig. 5.—See case report No. 4.

The great work of Dr. Parker's medical life began with the opening of the Ophthalmic Hospital in Canton in November, 1835, as a missionary hospital. As the name implies, this hospital was intended primarily for diseases of the eye, which were very prevalent in China; but the great abundance of general surgical material made it necessary to receive surgical cases into the hospital, and Dr. Parker's reports have to do chiefly with the latter cases. The hospital appears to have become quickly popular, for about the middle of 1837, men from distant provinces and from every rank flocked there.

At the Yale University School of Medicine, there is a collection of between eighty and ninety oil paintings illustrating surgical conditions as Dr. Parker found them in that country. These paintings were the work of a Chinese artist, and many of them are in excellent condition. They were particularly prized by the late Dr. Moses C. White, for many years professor of pathology in the Yale medical school and himself at one time a medical missionary in China. It is in searching through the Chinese Repository for the reports of this ophthalmic hospital at Canton and for the descriptions in these reports of the cases corresponding to the serial numbers of these paintings, that I have become interested in the work of its founder. From the first, he appreciated the necessity of training Chinese youths for medical service, and in his reports are occasional references to these students. In 1840, on account of the opium war between England and China, his work was interrupted and he returned to America, and in the winter of 1841 again attended medical lectures in New Haven and at the University of Pennsylvania. Up to this time, there had already been about 8,000 patients treated at the hospital in Canton. He did not return to China until the fall of 1842. During his stay in America, his main endeavor was to arouse interest in the affairs of China not only among those who cared for missions but also among government officials. On his second Sunday in Washington he preached in the Hall of Representatives to the members of the Senate and House of Representatives, an audience to which he refers as being one of the most enlightened of any age or nation. At this time Daniel Webster was about to become secretary of state, and the interest which Parker was able to arouse in him regarding the affairs in China was an important factor in the early establishment of diplomatic relations between that country and America. He was requested by Webster to submit in writing his views regarding the crisis then existing between America and China, and the steps which should be taken by this country in the situation. Parker did as requested, and the value placed on his statement is indicated by a very significant circumstance. When the first commissioner was sent by the United States to China a few years later (1843), he had been provided with a copy of Parker's letter in full.

Parker also took a trip to England and France in the interest of his cause. He married in Washington a Miss Harriet Webster, a connection of Daniel Webster and of Rufus Choate. The only description which I have found of his personal appearance was

written at this time. According to this he was a young man, tall and fine looking, a perfect blond. As a part result of his trip to America and Europe, he arranged for the sending out of additional physicians and surgeons to China; and still more important for the future of China, he perfected plans both in England and America for the education of Chinese students for medical work. The influence which he had already exerted in China was indicated by a letter written in 1841, by S. Wells Williams, who himself spent many years in China, becoming an authority on matters pertaining to that country and, in his later years, professor of Chinese in Yale. Mr. Williams wrote that no foreigner was so extensively known among the Chinese as Parker, the conductor of the hospital at Canton; that his gratuitous treatment of disease among the Chinese had done much to place foreign character on a better footing there, and to show them that we are not exactly the "devils" they took us for.

He reached Canton on his return in November, 1842. Mrs. Parker was the first foreign woman to reside in that city. Parker at once took up his medical work. He writes, "I have more work than any one mortal can perform. Never were my medical services sought with more avidity than now. Officers of high distinction seek them, and crowds of all classes." And in June, 1843, he records, "Arose at six o'clock this morning . . . have admitted two hundred patients at the hospital." And from Nov. 21, 1842, to Dec. 31, 1843, there were 3,501 patients admitted to the hospital.

As the interest of medical men is chiefly in his professional work, I will quote from some of his reported cases and show a few of the paintings referred to. While diseases of the eye appear to have been most numerous, and he speaks of couching eight patients in one afternoon, yet the major part of his reports have to do with surgical cases. I shall quote only one or two of these case reports in full and give brief notes of others, as many of them are too long to give entire. It is to be remembered that these reports were made to a group of nonmedical persons for publication in a nonmedical work.

Fig. 6.—See case report No. 5.

REPORT OF CASES

CASE 1 (No. 30621[3]).—*Fungoid tumor.*—Feb. 26, 1849, Chúshú, a Manchu, aged 54, had a fungoid tumor of the size of an orange, situated on the back near the right scapula and spine. The tumor was readily and successfully removed. Before leaving the hospital the patient made repeated solicitations to be allowed to send an artist and take the portrait of the surgeon; his importunity was at length acceded to, and a portrait taken in water colors, by the side of which on the same canvass was the following inscription in poetry, and an account of his case, and what he had seen in the hospital:

"What man is that? America's noble and disinterested man, who does to others as he would that others should do to him. His country is different from ours, his feelings are the same. In all distresses and diseases, he feels the sorrows and joys of others as though they were his own. Those cases which require the use of instruments, and which are difficult to others, are easy to him. He cherishes a mind that is divine, and bears the visage of Buddha; a full halo of glory surrounds his deeds, and he deserves immeasurable longevity. Parker's meritorious virtues are innumerable as the sands of the ever-flowing river. I denominate him a *Yé—sú*. What say you, yes or no?"

In addition to the poetry, he next proceeds to give the following statement:

"In the second month of the year of the cycle *ki-yú* (1849), I had a tumor on my back in an ulcerated state; I was also afflicted with a hemorrhoidal affection, to which the (Chinese) physicians with difficulty applied their hands, when I went to Dr. Parker for treatment, and was healed with speed divine. Moreover, I have in person seen him heal other men, and although their maladies were such as would baffle Lú I and Pien Tsioh,[4] there were none with which he did not succeed. Furthermore, possessing the influence of the example bequeathed him in Jesus, he delights in doing good, never tiring, and loves other men as himself. I have therefore taken this his portrait, and respectfully composed a few verses in order to keep in memory my constant sense of gratitude; as I stand before it, I remember him with respect and esteem. With the utmost sincerity, respectfully composed by Chúshú, styled Tsingtien."

The expressions of gratitude to Dr. Parker, couched in extravagant oriental language, appear not infrequently in the printed reports. Some of them might compete successfully with the twentieth century medical testimonials which are still served for daily pabulum by the press of our free country.

CASE 2 (No. 2152,[5] Figs. 2 and 3).—*Amputation at the shoulder joint.*—Po Ashing, aged 23, entered the hospital, Nov. 3, 1836. Six years since, he fell from a house and broke the humerus of the left arm. Union so far took place as to render the arm serviceable, till six months since, in a crowd at a "sing song," it was again broken. From that time, according to his statement, the arm gradually became larger till it had attained its present enormous size. Beside being painful, the weight of it drew him quite to one side. There was no doubt of its containing fluid. I punctured the arm, supposed that possibly it might contain pus. A dark greenish fluid escaped, with considerable force, but soon became darker and more bloody. The lancet was reentered nearly its whole length; but the same discharge continued with a greater proportion of venous blood; 32 ounces in all were discharged. All were agreed that the only chance of life was in the removal of the arm.

3. Chinese Repository, xix, 270.

4. Two celebrated physicians of antiquity.

5. Chinese Repository, v, 329.

At 11 a. m. (the next day) the patient was seated in a chair supported around the waist by a sheet. The time did not exceed a minute from the application of the scalpel till the arm was laid on the floor. The best representation of the arm after amputation, so far as shape is concerned, is that of a large ham of bacon. It weighed 16 catties, equal to 21¼ pounds. All who were present pronounced the case the most remarkable they had ever seen. The patient is the first Chinese, so far as I know, who has ever voluntarily submitted to the amputation of a limb. The patient made a good recovery.

It is to be recalled that these operations were performed before the days of anesthetics, and the rapidity of operating is striking.

Case 4 (No. 3000,[7] Fig. 5).—April 17, 1837. Lew Akin, aged 12 years, had a steatomatous tumor on the right hip, of a magnitude that required the patient to lean forward when she walked, in order to preserve her balance. April 27, the usual indemnity being given by the parents, the tumor was removed in two minutes and fourteen seconds. Its circumference (exceeding that of her body) was 2 feet at the base, and much larger at the middle; it was very slightly attached, and consisted of concentric layers of fatty substance, separated from each other by a surrounding serous membrane, till near the center it was found of a much firmer structure, resembling cartilage. It weighed 5 catties, or 7 pounds avoirdupois. In one week the whole was so far healed that the child was able to walk about the room without pain to herself or injury to the wound.

I am indebted to Lamqua, who has taken an admirable likeness of the little girl, and a good representation of the tumor. The more interesting cases that have been presented at the hospital, he has painted with equal success, and uniformly says that as there is no charge for "cutting," he can make none for painting.

The foregoing is of interest as it is the only reference which I have found to the artist who did these paintings.

Fig. 11.—See case report No. 10.

Case 5 (No. 3488,[8] Fig. 6).—*Cartilaginous tumor.*—May 22, 1837. Woo Pun, aged 41, a shoemaker, had been afflicted seventeen years with a large unshapen tumor on the left side of his neck. The tumor was 2 feet in circumference and weighed 7 pounds. The patient scarce uttered a groan. In twenty minutes he was comfortable in bed.

Case 10 (No. 15.000.[13] Fig. 11).—*Glandular tumor.*—Oct. 16, 1844. Yang Kang, aged 35, of Sinhwui, latterly a beggar in Macao, had a tumor on the right side of his face, which commenced in the situation of the parotid gland, measuring 2 feet and 6 inches in circumference, weighing when extirpated 6½ catties, equal to 8⅔ pounds. It commenced ten years since. Portions of the tissue cut harder than the rest, and approached a cartilaginous or semiosseous structure. The mingling hope of success and fears of the worst possible consequences excited devout and sincere intercessions at the throne of grace in his behalf, and an earnest use of means to prepare him for whatever might be the divine allotment. He was told that others fervently entreated the most high God to save him, but that it was desired that he himself should pray to Him who alone would succeed the means to be used.

This patient became the porter of the hospital.

In the following case, the serial number of the report does not agree with the number on the painting. As the description corresponds entirely with the condition shown in the painting, however, and as the results of the Chinese custom of binding the feet are of general interest, the report and illustration are here given as belonging together.

Case 11 (No. 23.944,[14] Fig. 12).—*Loss of both feet at the ankle, from compression.*—March 8, 1847. Lú Akwang, an interesting little girl of Honan, 7 years of age. February 9, agreeably to a custom that has prevailed in China for thousands of years, the bandages were applied "à la mode" to her feet, occasioned her excessive sufferings, which after the lapse of a fortnight became insupportable, and the parents were reluctantly compelled to remove the bandages, when, as the father represented, the toes were found discolored. Gangrene had commenced, and when she was brought to the hospital, March 8, it had extended to the whole foot. The line of demarcation formed at the ankles, and both feet were perfectly black, shriveled and dry, and nearly ready to drop off at the ankle joint. The left foot separated a few days after, and within about ten days, the right also, leaving the stumps healthy, the granulation rapidly covering the bone and new skin forming at the edges. The friends preferring it, notwithstanding advice to the contrary, they were furnished with the necessary dressings, and the child was treated at home, being brought occasionally to the hospital. The last time she was seen, the right stump had nearly healed over; the other was less advanced in the healing process. Since the occurrence of this case, I have heard, on good authority, of several others similar, a painful comment on the cruelty of this custom, to which millions in China have been subject during many centuries past. The origin of this practice has been ascribed to Tanke, an infamous empress, 1100 B. C., who was born with club feet. She is represented as having great influence over the emperor, whom she induced to issue an imperial edict, adopting her feet as the model of beauty, and requiring the compression of the infant females' feet so as to conform to the imperial edict. This account is necessarily traditionary, as it dates from a period long prior to the universal destruction of Chinese books in the Tsin dynasty, 300 B. C. Had the custom been introduced 200 years since by the conquering Tartars, as some European writers have stated, it must have been so recorded in existing history.

Another account furnished by an intelligent Chinese is as follows: "The compressing of the feet of female children, tradition says, commenced under the Emperor Yangte, of the Suy dynasty, 605 A. D., who ordered his concubine to bandage her feet, and in the sole of her shoe, there was placed a stamp of the lotus flower, with aromatics deposited within it, so that at each step she took there was left on the ground the print of the lotus flower; hence the saying that her steps produced

7. Chinese Repository, vi, 39.
8. Chinese Repository, vi, 436.
13. Chinese Repository, xiv, 450.
14. Chinese Repository, xvii, 141.

the golden lotus, and to the present day men compliment little girls with small compressed feet, by designating them the golden lotus."

The fact that none of the Chinese classics allude to the subject is presumptive evidence that the practice did *not* exist so early as the days of Confucius. During some of the successive dynasties the practice has been partially suspended, as under the Ming dynasty they were comparatively few, but it is very general among all, except the Tartars, in the present reign.

OTHER ACTIVITIES

In Parker's later reports are numerous cases of lithotomy, in some of which he removed calculi of large size, and one of the results of these operations is the unusual collection of large urinary calculi now in the possession of the Yale University School of Medicine.

Beginning with 1844, Parker was able to give somewhat less of his time to the hospital because of the diplomatic work which then and afterward engaged a part of his attention. Still, ten years later, on the date of his fiftieth birthday, June 18, 1854, he could record in his diary:

> To tens of thousands of Chinese I have been permitted to preach the gospel of salvation, and to 52,500 afflicted with physical ills of our common humanity, directly or indirectly, I have been permitted to administer with a degree of success that demands praise to Him who is the giver of health and life.

From the instructions of the Prudential Committee of the American Board of Foreign Missions, which were delivered to Dr. Parker on the occasion of the meeting at the Bleeker Street Presbyterian Church in New York, at which he was dedicated as a missionary, the following quotation is taken:

> The medical and surgical knowledge you have acquired, you will employ, as you have opportunity, in relieving the bodily afflictions of the people. You will also be ready, as you can, to aid in giving to them our arts and sciences. But these, you will never forget, are to receive your attention only as they can be made handmaids to the gospel. The character of a physician, or of a man of science, respectable as they are, or useful as they may be in evangelizing China, you will never suffer to supersede or interfere with your character as a teacher of religion.

These instructions Dr. Parker evidently carried out to the letter in all of his medical work.

When the first commisioner from the United States to China reached there in 1844, he at once appointed Parker as secretary to the legation, and they entered on what Parker speaks of as the gigantic undertaking of securing recognition and definite commercial standing for the United States. From this time he was employed first as secretary and interpreter, later as chargé d'affaires ad interim, and then acting commissioner. Under the strain of the excessive amount of work which he was carrying, his health gave way, and in May, 1855, he sailed for America. The prolonged rest on shipboard so completely restored his health that he reached America in fairly good condition. The affairs in China were so complicated that President Pierce urged him, as the best man available, to return at once to China for the purpose of arranging a new treaty. Parker finally accepted, and arrived at Macao in January, 1856. It is not my intention to follow him in this diplomatic work any further than to note that his first official act was to strike a blow against traffic in Chinese coolies. After establishing a basis for a new treaty between America and China, he finally left for America in 1857. The numerous honors which came to him in his later years are of interest, but hardly to be referred to here. In June, 1859, his only son was born, and his own birthday, which came five days later, we find recorded as the happiest birthday of his life; he knew then beyond doubt that "praying breath shall not be spent in vain."

Fig. 12.—See case report No. 11.

He began to collect the vast amount of material accumulated in China with a view of publishing a medical work, but this never went further than a comprehensive plan, with the beginning of an introduction.

In his declining years, he appears to have found especial satisfaction in his connection with the Smithsonian Institution, of which he was elected a regent in 1868 and remained as such until 1885. Much of his time he spent at his old home in Framingham, Mass. He died, Jan. 10, 1888, in his eighty-fourth year.

This short account of Dr. Parker's life has placed the emphasis on what appears to me to have been his greatest accomplishment. He was a missionary in the strict sense of the word, and a diplomat of no mean order. But his chief contribution to the spread of civilization was as a medical man, in founding medical missions. He appreciated to the full the value of combining the healing of disease with the teaching of eternal truth.

Drugs and Stamina.—If the quantity of medicine a citizen takes is any index of his physical condition, then this nation needs to take thought of the stamina of its people.—*Health Letter*, Life Extension Institute.

THYROID EXTRACT IN THE TREATMENT OF MALIGNANT UVEITIS*

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BALTIMORE

Last year before the American Ophthalmological Society I presented a communication entitled "Malignant Uveitis Treated With Thyroid Extract." It is my purpose to make this paper merely a supplementary statement.

I would have it understood that I do not claim that thyroid extract is a panacea for all types of malignant uveitis or, indeed, for any especial type. It will take much more investigation and many more cases than I have treated to prove even its usefulness. I have seen patients apparently relieved of uveitis by the administration of thyroid gland, and it seems to me worth while to call the attention of ophthalmologists to this very interesting possibility.

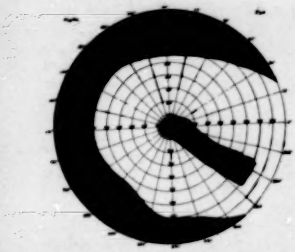

Fig. 1.—Field of vision, Case 1, Nov. 2, 1915.

In my original communication I said I was convinced that in malignant uveitis we had to deal with two factors: an infection, and an eye that makes a strong defensive, but lacks the something necessary to an offensive fight. Indeed, in every one of the five cases there cited, a focus of infection outside of the eye was discovered. While it is proper that we should bend our efforts to the discovery of the source of infection, it must be remembered that the mere finding of a focus is not proof of its causative relation. Nor should we forget that malignant uveitis once established becomes an entity and not a symptom. We can remove the original source of infection and still not materially lessen the progress of the ocular changes.

We cannot anticipate and often cannot discover secondary foci which may play an important part in the degenerative process. It therefore becomes necessary for us to fortify the eye against invasion, and to promote a strong offensive effort on its part.

Having observed the profound changes which frequently occur in the thyroid gland following severe infections, such as tonsillitis, peritonitis and skin burns, I am prepared to believe that the thyroid gland plays an important part in the body's fight against infection or the results of infection. To me, therefore, it is not a very great stretch of the imagination to believe that the favorable results obtained in the treatment of uveitis with thyroid extract are based on a very logical foundation.

Of course it can be argued, and with much reason, that the cases cited by me have not passed over as long a period of quiescence as do many cases before there is a repetition of the attacks. My personal experience, however, does not lend color to this argument. I am as doubtful of "repeated attacks" of malignant uveitis as I am convinced of recurrent acute exacerbations of a latent malignant uveitis. In other words, I have seen cases during quiet periods; but in all of these cases there was definite evidence that the uveitis still existed. Now, of cases dealt with in my former article four of the patients, so far as can be determined by examination, are well, not one of them having had the slightest sign of trouble since my last report. While I am not prepared to say that these patients will not have attacks in the future, I am convinced that if such a misfortune should overtake them, we have an efficient remedy at hand to combat their disease.

I have additional evidence in two new cases to support the idea of the value of thyroid extract in malignant uveitis.

REPORT OF CASES

Case 1.—A woman, aged 27, for several years has come to me for glasses from time to time. Both with and without low grade hypermetropic astigmatic lenses, her vision was normal. No pathologic changes were ever found. Nov. 2, 1915, she consulted me about her right eye. The cornea was steamy, the iris semidilated but responsive to light and accommodation: vision was $\frac{2}{200}$, the result of a large central scotoma (Fig. 1). Tension was 45. She was placed in the hospital, and a strong solution of physostigmin (eserin) was instilled in the eye every two hours. As the tension had increased in twenty-four hours to 70 and the pain was more intense, she was given sodium salicylate in large doses often repeated. During the late hours of the same day the tension fell to 40, and in twenty-four hours the steaminess and pain had disappeared and the tension was 22. In a few days there was an increase in tension to 60, and for the first time a slight circumcorneal injection and dots on Descemet's membrane were noted. A systematic investigation was then started. Dr. Thomas R. Brown made a complete physical examination, including analyses of urine, stomach contents and feces, and reported the patient physically normal. A Wassermann test was made by Dr. Albert Keidel, and proved negative. Tuberculin reactions were negative. Dr. Henry Strasser, a dentist, was asked to examine the teeth. He found a "suspicious bicuspid right upper jaw." This suspicion was confirmed by roentgenoscopy, and when the tooth was extracted it uncovered quite a large periapical abscess and much destruction of the root. A complete Roentgen examination of all the teeth and the accessory nasal sinuses failed to reveal further trouble. An encysted mass of foul smelling débris was removed from the right tonsil. For eleven days following extraction of the tooth the sodium salicylate and physostigmin were continued. At the end of that time the posterior surface of the cornea was covered with deposits, and the patient suffered intensely from photophobia. Iodothyrin in doses of 2½ grains was then started, given at first once a day and then increased to three times a day. All other medicine was discontinued.

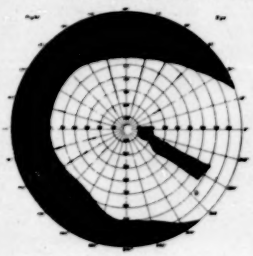

Fig. 2.—Field of vision, Case 1, Dec. 8, 1915.

The rapidity of the change for the better can be best appreciated by a glance at the fields of vision, one taken November 2 (Fig. 1) and the other December 8 (Fig. 2). There was a like alteration in the descemetic disturbance, and the intra-ocular tension at this date was 35. Jan. 31, 1916, the eye was to all appearances entirely normal except for a scotoma, and the vision was $\frac{20}{15}$. The patient was seen

* Read before the Section on Ophthalmology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

a day or so ago and carefully examined. Except for the small scotoma which has persisted the eye was free from trouble.

CASE 2.—A woman, aged 25, married, developed trouble in her right eye in June, 1915. She consulted an ophthalmologist who told her she had an incurable form of malignant uveitis. She came to me for a glass for the left eye, December 16. I found a pronounced attack of uveitis in the right eye with a clouded vitreous, pupil moderate in size and barely responsive to light, the iris free from tags (Fig. 3). Tension in the eyes

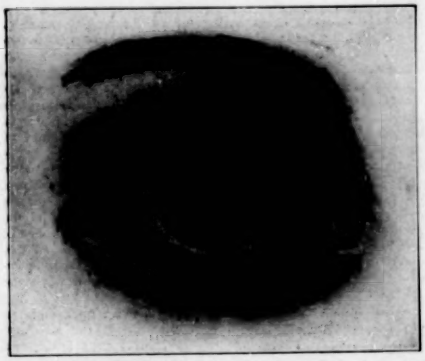

Fig. 3.—Condition of eye, Case 2.

was abnormally low, registering only 12. Vision was 20/100. The posterior surface of the cornea was filled with deposits of various sizes.

This case was to me one of more than ordinary interest because I had treated a sister with choroidoretinitis and nystagmus, had seen a brother with an almost complete absence of the bridge of his nose, and knew that her father prior to his marriage had contracted syphilis for which he had refused treatment. I knew also that her mother had a serious form of exophthalmic goiter.

Iodothyrine in 2½ grain doses was immediately started, and increased until she was given 7½ grains a day.

December 22, vision was 20/50, the tension had increased to 20, and she was greatly impressed by her improvement. January 15, her vision had improved to 20/40, and the temporal half of the vitreous was clear enough to study the details of that portion of the fundus. January 31, the vitreous had still further cleared, and no dots were discoverable on Descemet's membrane. Vision was 20/30, less one or two letters. When she passed from under my care the latter part of February her vision was a full 20/30, her vitreous entirely clear, with no deposits on the cornea, and except for an enlargement of the blind spot (Fig. 4) I could discover no evidence of her former trouble.

During her treatment she at first complained of marked double vision. The cause of this I was never able to determine. Prior to the introduction of the iodothyrine this patient was found physically normal. Roentgenograms of the sinuses and teeth were negative, and the Wassermann reaction was likewise negative. I think it is quite possible that the eye disease was a late manifestation of inherited syphilis.

330 North Charles Street.

ABSTRACT OF DISCUSSION

DR. NELSON M. BLACK, Milwaukee: It is certain that none of the methods of treatment for malignant uveitis has heretofore given results in a sufficient number of cases to warrant our placing any dependence on any one form of treatment. In the majority of instances there is improvement for a time, possibly, but in nearly every instance the result is the same, an acute exacerbation or a recrudescence, for these cases are rarely absolutely cured. Even in cases of apparent complete disappearance of the disease, the eye is practically useless, the result of the vitreous opacities which fail to clear up, or which become more numerous and dense, or the permanent opacity of the cornea, due to the density of the exudate. Dr. Bordley's hypothesis as to why thyroid extract should be beneficial in the treatment of malignant uveitis seems based on thoughtful deduction and sound judgment. First, there is a primary source of infection somewhere in the body. Second, an organ is invaded which puts up a strong defensive, but lacks "the something" to make the fight effective. But why was that organ invaded primarily? Was it not because "the something" was lacking which Dr. Bordley has found, if added to the body, stimulates the fighting power of the eye? The result of the invasion of the eye from the primary source of infection is malignant uveitis, but this is not the end-result, for removal of all the discoverable sources of infection, together with local treatment of the affected part, does not tend to improve the condition. Is it not because the eye itself has become the source of infection, which now more than takes care of "the something" which the body should have furnished to combat the primary invasion? This "something," from the results obtained by Dr. Bordley in the reported cases, appears to be the secretion of one of the ductless glands. This substance must have been lacking in the body in sufficient amounts or we should not have had the original invasion of the system. So it seems we must go back still further and seek the cause of the lack of sufficient secretion of the ductless glands to protect from systemic invasion by infection. Dr. R. C. Brown of Milwaukee recently advanced the theory that through the ingestion of too great quantities of meats, meat soups and eggs the natural defenses of the body, of which the ductless glands are the principal ones, cannot neutralize and render harmless the protein poisons they contain. As a result the body resistance is lowered and invasion is invited. Dr. Brown has found that complete elimination of the foodstuffs containing protein poison from the diet of individuals who are susceptible to its effects results in the manifestations promptly disappearing. So it may be possible that the primary etiologic factor is in the main a protein diet in excess of the individual's ductless gland capacity. I should like to mention a case of mild but persistent uveitis following the extraction of a cataract by the Smith-Fisher method in a woman of 65. The operation was performed about two weeks after she had been subjected to an hysterectomy, as she did not wish to return to the hospital again. The eye was not looked at for seven days following the extraction, as she had no discomfort. When the bandage was removed the lids were edematous, and there was marked photophobia and free lacrimation. The cornea was clear and bright, but there was considerable circumcorneal injection, and she claimed she could not see anything. The patient was also morose, nervous and despondent. Hot compressions, atropin and dionin were ordered and for a week no change seemed to take place. At this time I received a copy of Dr. Bordley's paper. I immediately ordered 1 grain doses of thyroid extract twice daily, increasing cautiously, and meats, meat soups and eggs were eliminated from the diet. Within a week the change was marvelous. The local treatment was stopped and the patient became cheerful and happy, and within a few days told

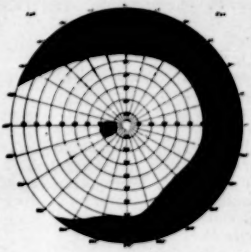

Fig. 4.—Field of vision, Case 2, Feb. 26, 1916.

me she could see to count her fingers. She was making rapid progress when seen last.

DR. EDWARD C. ELLERT, Memphis, Tenn.: I have used thyroid extract in six cases of uveitis and I am impressed with the fact that in addition to the treatment of accompanying and apparently casual constitutional conditions, the relief of focal infections, etc., thyroid extract seems to have a beneficial effect in uveitis, but more extended experience is needed to enable us to say what we may expect from its use.

DR. CLARK W. HAWLEY, Chicago: Four years ago I had a very severe case of erysipelas which left me with several troubles that I could not account for. One of them was swelling of the feet and legs, and it was difficult for me to walk on account of pain. I supposed it was heart and kidney trouble, but both were eliminated. I went to a laboratory and they told me I was suffering from autointoxication at this time. I had had chronic uveitis for some time, so that it was difficult to read newspaper print without shaking my head, when the bodies would float back again. I saw two large yellow circles composed of small opacities. They were increasing in size. Fortunately I discovered the source of it. I commenced treating the autointoxication for the swollen feet, and within thirty days more than half the opacities had disappeared. In two months I could read newspaper print comfortably. This was in September. I used a restricted diet mainly. In February or March I believed I might increase the diet a little and I made an attempt to eat meat. In a week the opacities began to return. I stopped using meat and the effect could be seen in a few days. I have quite a number of patients with chronic uveitis who have, from that discovery, been very much benefited, so that, perhaps, my personal experience may be of as much value to others, to help clear up some indefinite cases.

EFFECTS OF HEAT ON THE EYE*

WILLIAM E. SHAHAN, M.D.
ST. LOUIS

Since ophthalmic thermotherapy is in an indefinite state, and the beneficial or harmful effects of heat on the eye are moot questions among ophthalmologists, it is desirable to make an exact study of the effects of heat when applied to the eye in various conditions of health and disease.

In order that the study may be exact, the following preliminaries must be satisfied:

1. The devising of some simple, convenient means of applying constant, measured quantities of heat directly to the corneal or scleral surfaces for measured lengths of time.

2. The determining by experiment on animals of the physiologic limit of heat tolerance for stated lengths of time. The physiologic limit of heat tolerance will be defined as the maximum temperature at which tissues may be held for stated lengths of time without permanently harmful effects.

3. The application of physiologic limits to various pathologic conditions (infections, etc.), and tabulation of results. This is the aim and end of the study.

The first of these preliminaries was solved in a satisfactory way by the construction of an instrument which may be conveniently designated as a thermophor.

DESCRIPTION OF THE THERMOPHOR

This consists of a central brass tube one-half inch in diameter and 6 inches long with a walled off slot 4 inches long and five-sixteenths inch wide, cut into its side. This walled off rectangular space communicates directly with the interior of the tube and serves to contain a zinc-iron sensitive strip. One end of this sensitive strip is fixed to insulating material in one end of the slot; the other end is tipped with platinum plate and swings free. Around the brass tube and the rectangular space containing the sensitive strip, a sheet of insulating material is placed, and around this is wound about 6 feet of No. 26 nichrome resistance wire. One end of the resistance wire is fastened to the fixed end of the sensitive strip while the other serves as one of the terminals of the electric heating circuit. Over the end of the rectangular space in which the platinum tipped end of the sensitive strip swings is a small brass casing tapped for an 8-32 machine screw and fastened by means of insulating material to the central brass tube. The machine screw carries on its head a nonconducting disk of fiber. Its tip carries a platinum point. The screw is connected directly with the other terminal of the heating circuit. By revolving this screw, its platinum tip can be brought into contact with the platinum plate of the sensitive strip and current be made to flow through the resistance wire, generating heat. Almost immediately the zinc element of the sensitive strip will expand more than the iron, and carry the platinum plate away from the platinum tip of the regulating screw, breaking the circuit and stopping the heat. Shortly the strip will cool and the plate again come into contact with the screw point, reestablishing the circuit and heat flow for a few seconds. After oscillating for a short time, the temperature of the interior of the central brass tube will settle down to a nearly constant quantity.

When it is desired to use the instrument, a nickel plated brass heat conducting head or applicator of the size and shape desired is placed within the central brass tube and allowed to project about one-half inch beyond its end. This projecting end is shaped to a definite size, and is intended to be placed in direct contact with the part of the eye to be heated. The center of this applicator is drilled out as nearly as possible to its tip so as to contain a thermometer. In the end of the central brass tube opposite the end containing the applicator is a small brass collar with an aperture of a size just sufficient to admit the thermometer. When the thermophor is in use, therefore, the thermometer extends through its center and has its bulb in the exposed head of the applicator.

Around the above described resistance wire is placed suitable insulating material and the whole inserted into a tube of ordinary red fiber so as to make a neat looking instrument. The amount of resistance wire used in the instrument is just enough to get the desired heat when connected up in a series on a 110 volt current with a 32 candle carbon lamp. If connected directly with a 110 volt current, the amount of heat generated would shortly destroy the instrument. Up to 130 F. this instrument can readily be kept constant within 1 degree. Up to 150 F., variations of 1½ degrees may occur. The platinum terminals must of course be kept clean.

The apparatus for determining the thermal behavior of the interior of the eye, when the applicator of the thermophor is in contact with all or a part of its accessible surface, consists of a dead-beat low resistance galvanometer supplied by the Leeds & Northrup Company, a vacuum bottle and several German silver-iron thermocouples and all-iron switch with several poles. The galvanometer was kindly lent me by Prof. Lindly Pyle from the Department of Physics in Washington University. German silver and iron wires (of small caliber) were selected for these investigations by advice of Professor Pyle. The special advantage of these two metals for thermocouple junctions is that for the required range of temperature (from 80 to 150 F.) that part of the hyperbolic curve used is practically a straight line.

In constructing the thermocouples for these investigations, two German silver wires were soldered at one end to an iron wire, which was connected to one pole of the galvanometer. The two German silver wires were then soldered at their other ends to two iron wires which were connected to two separate poles of the iron switch. Another iron wire

* From the Laboratory of Ophthalmological Pathology, in the Department of Surgery, Washington University Medical School.
* Read before the Section on Ophthalmology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

ran from the switch to the other pole of the galvanometer. By means of this arrangement either of the junctions could be almost immediately connected with the galvanometer, and the temperature of its surroundings indicated. For calibrating these thermocouples an especially large thermophor with a sensitive strip 8 inches long and about 15 feet No. 26 nichrome resistance wire was constructed so that temperatures could be held constant within very narrow limits for long periods of time. Previous attempts at calibration in water heated by a Bunsen burner had ended in failure, owing to "lag" of the mercury in the thermometer. In this calibration a large bulbed thermometer with a long stem was used, and no reading was taken until after the mercury had been stationary for some time and all motion of the galvanometer mirror had ceased. All thermometric readings were made with the aid of a hand lens and from a position such that the scratch on the thermometer stem was exactly in line with its image as reflected from the column of mercury. The junctions to be calibrated were bound to the bulb of the thermometer. The cross piece on the arm of the galvanometer is graduated in millimeters and it was found that 1 F. corresponded to exactly 4 mm. of the arm throughout the whole range from 90 to 150 F. The readings obtained from a smaller thermometer used in the thermophor proper would differ from those obtained from the larger (and slower) thermometer by from 0.1 to 0.4 F. The probable limit of accuracy of all readings may be stated with reasonable certainty to be 0.25 degree F. as shown by variations in several graphs drawn.

When this apparatus is set up for use, the common joint, where two German silver wires are soldered to one iron wire, the whole being insulated, is placed in the vacuum bottle which has been filled with cracked ice and water drained from it (the ice having been made from distilled water). It takes about three days for the ice placed in a vacuum bottle like this to melt; consequently a junction placed in such a bottle can be kept at constant temperature for that length of time, and the apparatus be constantly ready for use. The other junctions can then be arranged (say) so that one is in a groove in the tip of the applicator of the thermophor, and in direct contact with the corneal surface, while the second is in the large calibration thermophor so that if the galvanometer should be accidentally jarred, it can be properly readjusted. With the apparatus thus set up, we are in a position to read off the average temperature of the applicator (from the thermometer in it), and the exact temperature in the transition plane between the tip of the applicator and the corneal (or other) surface, in quick rotation, and study any relation between them.

In these experiments it is necessary for the wires of the thermocouples to be insulated by some convenient material that takes up very little space. The best material found for this purpose was a celluloid varnish made by dissolving 15 gm. of sheet celluloid in 85 c.c. of acetone and 15 c.c. of amylacetate. This makes a firm, flexible, waterproof insulation entirely stable for the temperatures employed, and easily painted on with a camel's hair brush.

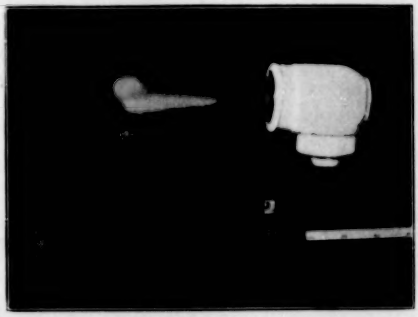

Fig. 1.—Complete thermophor with connections.

EXPERIMENTS

In rough preliminary experiments in which parts of dog's or pig's eyes were placed in a test tube with a thermometer and 0.7 per cent. sodium chlorid solution and the whole slowly heated in a water bath over a Bunsen burner, the following results were noted:

1. Corneal epithelium began to cloud faintly at 122 F. and became unmistakably clouded after remaining at that temperature for one minute. At 123 F. there was slight opalescence of corneal substance, at 130 F. dense opalescence. At 138 F. the epithelium was white, and at 140 F. the corneal substance was shrinking and the epithelium shriveled.

2. The lens began clouding slightly at 135 F.; began to get opalescent at 142 F.; became opal white at 157 F., and pearl white above that, and became of a firm rubberlike consistency.

3. Vitreous remained perfectly unchanged until the temperature approached 212 F., when the whole gelatinous mass became perfectly fluid, and remained so on cooling, even to low temperatures (approaching 32 F.).

These experiments would suggest beginning on living eyes with a temperature of about 120 F. and varying that according to findings.

It is realized that when the temperature of the applicator is raised considerably above the normal temperature of the eye, the surface applied to the eye, in consequence of rapid withdrawal of heat, may have a lower temperature than that indicated by the thermometer within it. Accordingly, a small hole was drilled through the end of an applicator parallel to the surface to be applied to the eye and as near to it as possible. Within this hole was placed a thermojunction, and the temperature indicated by it compared with that indicated by the thermometer. By means of this arrangement it was found that up to 125 F. the thermometer accurately indicated the temperature applied to the corneal surface (our limit of accuracy is 0.25 F.). At 128 F. the thermometer was 1 degree ahead of the thermocouple, at 131 F. the thermometer was 2 degrees ahead, and at 135 the thermometer was 3.6 degrees ahead.

Corrections for these differences are made in the readings noted below. It was soon found in searching for physiologic limits that the different tissues of the eye have different limits.

The first to succumb to heat is the corneal epithelium. The limit of tolerance of this tissue was determined by means of an applicator with an end surface 14 mm. in diameter, consequently covering the entire cornea. It was found that application of 120 F. (48.9 C.) for ten minutes removed the epithelium completely over the whole of the area heated; 119 F. (48.3 C.) did likewise; 118 F. (47.8 C.) left an irregular border of incomplete desquamation. By the next day this had desquamated, leaving a sharply defined border. A temperature of 117 F. (47.2 C.)

applied for ten minutes caused an extremely faint opalescence, but not the slightest immediate desquamation, as shown by total absence of staining with fluorescein. Twenty-four hours later, however, an area 5 by 3.5 mm. had desquamated. Forty-eight hours later this was completely replaced, but clouded. The clouding disappeared in three or four days. A temperature of 116 F. (46.6 C.) did not cause any desquamation, immediate or remote, nor was there any clouding or other pathologic results. This may be stated, therefore, as the limit of physiologic tolerance of the corneal epithelium for a ten minute application.

When temperatures higher than 117 F. were used with an applicator covering all or most of the cornea, it was observed that the epithelium replaced itself rapidly to within 1.5 or 2 mm. of the center, or even replaced itself entirely, but subsequently broke down and entered into a state of dystrophy during which the substantia propria gradually wasted away with much discharge of leukocytes, perforation occurring after about three weeks. When the area denuded of epithelium was no greater than 11 mm. in diameter (where the cornea was 14 mm. in diameter), no such effects were noted, the epithelium replacing itself completely and permanently.

The anesthetic used in these experiments was cocain 5 per cent. in epinephrin 1:2,000. The "drying effect" of cocain must be guarded against. The drying is not due to the cocain but to the fact that when a rabbit's cornea is anesthetized, the animal will not blink its lids. In this regard a rabbit's eyes appear to be independent of one another. The untreated eye will blink, while the anesthetized one will remain constantly open and its surface dry.

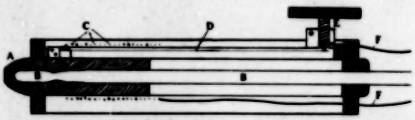

Fig. 2.—Longitudinal section of thermophor: *A*, applicator; *B*, *B*, thermometer within applicator; *C*, resistance wires for generating heat; *D*, zinc-iron sensitive strip; *E*, regulating screw; *F*, *F*, wires for electric current.

In applying heat for effects on the substantia propria, an applicator with a 7 mm. point was used. The following data were obtained:

A temperature of 124 F. (51.1 C.) applied for ten minutes did not cloud the substantia propria. Twenty-four hours later an area 7 by 8 mm. was denuded of epithelium; forty-eight hours later the denuded area was 2.5 by 3 mm.; seventy-two hours later, the epithelium was entirely replaced. The cornea was clouded over the treated area. Two weeks later, the cornea was entirely clear. A temperature of 128.4 F. (53.5 C.) applied for ten minutes to the upper part of the cornea caused slight clouding of the substantia propria (Bowman's membrane being included with this structure). One day later, the whole upper part of the cornea was opal white, and the iris was indistinctly visible through it. There was no discharge. A sharply defined area 9 by 9 mm. was denuded of epithelium. Three days later, the epithelium was completely replaced; the cornea continued opalescent. Seventeen days later, the cornea was entirely clear except for slight pigmentation which streamed in from the periphery during the process of repair.

A temperature of 131.6 F. (55.3 C.) applied for ten minutes caused some clouding over the area treated. Next day an area 10 by 11 mm. was denuded of epithelium. The cornea was more clouded. Six days later there was a very faint clouding of the cornea with faint irregularity of the surface. Twenty-four days later it was almost entirely clear.

A temperature of 135.3 F. (57.4 C.) was applied for ten minutes under a general anesthetic (ether). The cornea was markedly clouded over the area treated. The epithelium was denuded over an area 11 mm. in diameter (the diameter of the cornea was 14 mm.). That part of the cornea not in contact with the applicator was not changed. Next day the cornea was more clouded. The pupil was somewhat irregular at the lower side. The epithelium was denuded over an area 9 mm. in diameter. Two days later, the epithelium was denuded over an area 4 by 6 mm. Three days later the epithelium was entirely replaced, but the clouding unchanged. Seven days later, the cornea still was gray and bulging over the site of the application in the form of a keratoconus. Vessels were growing markedly into the cornea from above; there was no discharge. Ten days later, keratoconus was more marked. Twelve days later keratoconus was very marked. Fifteen days later, the keratoconus was receding, and the cornea was much clearer. Twenty days later, the keratoconus was about gone, and the cornea was clouded only over the center of the heated area. Twenty-eight days later, the keratoconus was gone, and the site of apex was occupied by a slightly pigmented and vascular scar. Most of the cornea was clear.

It is evident from these experiments that the substantia propria has no sharply defined limit of physiologic tolerance to heat, but that the effects on it vary increasingly with increase in the intensity of the heat applied. It would appear, however, that about 130 F. (54.4 C.) is as high as it is safe to go without producing gross permanent changes.

There are some changes in the interior of the eye worthy of note:

Shortly after one cornea had been anesthetized, the pupil was 11 mm. in diameter. After the application of a 14 mm. applicator ten minutes at 116 F. (46.6 C.) the pupil was 3 mm. in diameter, although the anesthetic effect on the cornea was still in full force. This miotic effect of heat was a constant and striking feature in all these experiments. In cases in which the pupil was fully dilated and the heat centrally applied so that the point of application was rather distant from the iris, the effect was less noticeable. When the experiment was done under ether, the effect was much more marked. The miosis was always transient. When the heat reached 128 F. (53.3 C.) and was applied opposite a part of the iris, either above or below, that part of the iris subsequently (in about two weeks) became gray, somewhat shrunken and drawn toward the filtration angle, and evidently atrophied, without apparent injury to the rest of the iris or the eye. Physostigmin (eserin) applied in such a case did not affect the discolored part, while causing marked miosis in all the rest of the iris.

By means of the thermocouple set up as described above, the rate at which heat passed through the cornea was studied. First, general data as to the rabbit's temperature were obtained. The rectal temperature (thermometer) was 104.2 F. (40.1 C.). The rectal temperature (thermocouple) was 104.2 F. The temperature of the upper culdesac varied from 102 F. (38.9 C.) to 103 F. (39.4 C.), increasing as the eye was handled. The temperature of the lower culdesac varied from 102.2 F. (39 C.) to 103.7 F. (39.8 C.), increasing as the eye was handled. The temperature under the third lid was constantly 103 F. (39.4 C.).

The junction was then introduced into the center of the anterior chamber just behind the cornea. The temperature there ranged from 101.2 to 101.7 F. (38.4 to 38.7 C.). A 7 mm. applicator was then applied at 123 F. (50.5 C.). The temperature just behind the cornea rapidly rose to 116.5 F. (46.9 C.), where it became stationary. The applicator was then removed, and the temperature dropped to 102.5 F. (39.2 C.) in fifty seconds. The applicator was then raised to 132.5 F. (55.8 C.), and applied to the cornea. The tem-

perature just behind the cornea then rose rapidly to 124 F. (51.1 C.), where it became stationary. The applicator was then removed, and in one and a half minutes the temperature just behind the cornea fell to 103.2 F. (39.5 C.) and subsequently fell slowly to 100.2 F. (37.9 C.). The applicator at 133 F. (56.1 C.) was now applied to the cornea, and the temperature just behind the cornea rose from 100.2 F. (37.9 C.) to 122.7 F. (50.4 C.) in one and a half minutes.

The vitreous was apparently unaffected by changes in the anterior chamber, remaining constantly at a temperature very near that of the body temperature of the animal. This shows that heat passes rapidly through the cornea in either direction. Any degree of heat, therefore, that will affect organisms or pathologic conditions on the surface of the cornea ought to affect them anywhere in its interior.

Most of the eyes on which the foregoing experiments were performed have been removed, and are being prepared for histologic investigation by Dr. Harvey D. Lamb, to whom I am indebted for earnest cooperation throughout this investigation. The results of this will be reported in a separate paper.

There are some organisms, such as the pneumococcus of ulcus serpens, that have a relatively low thermal death point. The destructive effects of this organism on some corneas are well known. There appeared to be excellent theoretical reasons for believing that the cornea would stand more heat than such invading organisms. It was now very desirable to obtain some virulent pneumococci for the production of experimental hypopyon ulcers. After considerable difficulty this was finally accomplished by Dr. Lamb, who procured material from the lung of a patient who had died of bronchopneumonia with pulmonary infarction and thrombosis of a lateral sinus.

This was injected into mice. These died of general septicemia, and cultures were taken from the blood of one of them on serum agar. A profuse growth of pneumococci (identified in the laboratory of bacteriology) took place on this. Material from this tube was then inoculated into the center of the cornea of several rabbits. Ulceration took place in every case. Some of them proceeded to spontaneous cure with or without hypopyon. Others ran a destructive course with hypopyon.

To these ulcers various degrees of heat were applied with variously sized applicators according to the size of the ulcer. In one case 125 F. (51.7 C) was applied for eight minutes with a 4 mm. applicator. Next day the ulcer was larger and progressing steadily. Then 129 F. (53.9 C.) was applied for ten minutes under ether. The ulcer was now about 5 mm. in diameter. An area 8 mm. in diameter was denuded of epithelium. From day to day the ulcer steadily grew larger. The epithelium, however, completely replaced itself, converting the ulcer into an abscess by the third day. This was punctured and thick pus expressed from the substantia propria. Microscopic examination showed this to be chiefly mucoid material with a few bacteria. A serum agar culture gave a profuse growth of pneumococci in twenty-four hours.

In another case, 130 F. (54.4 C.) was applied for ten minutes under ether. This ulcer recovered beautifully, as also did the opposite entirely untreated control.

In another case, 130 F. was applied for ten minutes under ether. The heated cornea at the present writing is in worse condition than the opposite untreated control.

In short, any temperature up to 130 F. applied directly to an ulcus serpens for ten minutes appears to have no beneficial effect whatever. It is probably even harmful. This is the only condition so far investigated.

Before heat is discarded as useless in these conditions, however, it is necessary to investigate another method of applying it, namely, that of applying higher degrees for shorter lengths of time. As shown above, the full temperature applied to the anterior surface of the cornea reaches the posterior surface within two minutes, possibly within one minute. If now beginning at 135 F. or about 57 C. successively higher temperatures are employed, there will certainly come a time when infecting organisms will be destroyed. The effect of this temperature on the cornea for the given length of time can then be studied, and its usefulness or uselessness be established. An investigation of this sort is now under way.

ABSTRACT OF DISCUSSION

DR. T. B. HOLLOWAY, Philadelphia: While the various properties or physiologic actions attributed to heat are well known, the most suitable method and duration for its application and the benefits to be derived from it in certain conditions are still matters for discussion. In eye affections heat, as it can now be employed, is in the majority of instances an adjuvant to other lines of treatment, if we exclude the direct effect on certain conditions or structures that have been attributed to diathermy. It must also be considered as to whether it is to be used for what might be described as its stimulating effects, styptic influences, or its destructive and cauterizing action. Numerous instruments or appliances have been devised for the application of either dry or moist heat, but none has been more ingenious in its construction that the one described by Dr. Shahan, which has also the distinct advantage of accurately measuring the degree of heat applied. As he has stated, it remains for his future experiments to prove whether it has certain clinical advantages over other methods or appliances already described. It is probable that the use of Dr. Shahan's instrument would be attended by greater risk and it seems to approach more in its action the hot air douche or the method of Weekers, although both of these methods cause distinct, if only temporary, changes in the cornea. Further, are these methods superior to the application of moist heat by means of hot irrigations, hot compresses, the dropping of hot water on the eye, the steam spray, or the mixture of steam and hot air? Finally, how do these measures compare in their efficiency to the development of heat by high frequency currents, so-called diathermy? In regard to the albumin content of the aqueous and the predominance of antibodies, Sattler found that hot air was no more efficient than other types of heat; that the agglutinins and hemolysins were increased by temperatures that produced inflammatory irritations, but that the highest temperature tolerable had no effect on the antibodies. In this respect subconjunctival injections and tapping the anterior chamber were more efficient. After later experiments he stated that diathermy afforded greater effects on the ciliary body than subconjunctival injections. Zahn found that the temperature of the conjunctival sac could be raised on an average of 4.2 by diathermy, against 1.6 C. with hot applications. The results of various researches show that with diathermy the temperature tolerance is quite uniformly placed at 44 to 45 C. (109.4 to 113 F.) at which point chemosis of the conjunctiva and corneal changes develop; 42 C. (107.6 F.) is about the height that can be reached with comfort and safety. The highest obtained by Waldmann on the human eye was 42 with diathermy and 37.5 (99.5 F.) with hot application.

If these various temperatures be compared with the temperatures obtained by Dr. Shahan, whose experiments were made under cocain or ether, it will be found that he attained considerably higher temperatures, that is, 46.6 C. (116 F.) as the physiologic tolerance of the corneal epithelium for a ten minute exposure, while 53.3 C. (128 F.) caused permanent changes in the iris; a higher temperature than 54.4 C. (130 F.) was apt to be followed by definite changes in the corneal stroma.

Weekers and Angus MacNab have stated that a temperature of 42 C. (107.6 F.) for twenty-four hours will kill

the pneumococcus and Morax-Axenfeld bacillus, while the former will succumb to a ten minute exposure at 56 C. (132.8 F.), the latter to a five minute exposure at 55 C. (131 F.). In his experiments on rabbits the essayist was still capable of obtaining a positive culture from a pneumococcus corneal lesion after a ten minute exposure to a temperature of 53.9 C. (120 F.) and states that a temperature of 54.4 C. (130 F.) was of no value. We will watch with interest the future experiments of Dr. Shahan when he uses a high temperature and shorter exposure, conditions that would seem to bring his heat effects in closer relation to that obtained by Weekers, Bourgeois and others. In the presence of severe cornea ulceration after the failure of such cauterizing agents as phenol and iodin thoroughly applied, I rely on the actual cautery, but we must not lose sight of other adjuvants such as the vaccines.

Dr. John Green, St. Louis: Dr. Shahan's experience with this method in experimentally produced pneumococcus ulcer in rabbits was not encouraging. Recently an opportunity presented itself to try the thermophor on a patient with hypopyon keratitis. The applications were made under the supervision of Dr. Shahan so that the conditions were favorable for a fair test. A worker in a chemical factory presented himself May 28 with a 4 mm., nearly round ulcer near the center of the cornea. There was hypopyon rising to a little less than one-quarter the height of the anterior chamber. Smear and culture showed pneumococci in abundance. The thermophor was brought to a constant temperature of 115 F. and gently but firmly held in contact with the ulcer for ten minutes. The contact was practically continuous, except for momentary withdrawals, due to sudden shifts in the position of the eye. At the end of the seance it was found that the epithelium had been denuded to a total diameter of 5 mm., the ulcer proper measuring 4 mm. Atropin, 1 per cent. three times a day, and boric acid irrigations were ordered. May 29 there was only slight change in the ulcer; the hypopyon was either stationary or had increased a trifle. Thermophor applied for ten minutes at 121 F. May 30, the hypopyon was appreciably higher and the ulcer measured 5.5 mm. in diameter. Thermophor applied at 122 F. for ten minutes. May 31, hypopyon increased, ulcer spreading superficially as indicated by nasal and temporal subepithelial yellowish exudates. Thermophor applied at 124 F. for five minutes to the nasal side of the ulcer and for five minutes to the temporal side. June 1, there was positive increase in the size of the ulcer but no tendency to penetrate deeply. It was deemed inadvisable to pursue this line of treatment further. The edges of the ulcer were touched with 20 per cent. zinc sulphate solution and the ulcer itself buried in a mass of methylene blue powder. The following day the inflammatory signs were less marked and the hypopyon had diminished. A continuance of the methylene blue treatment was effective in checking the further spread of the ulcer and the hypopyon gradually diminished. The patient is now making satisfactory progress.

Dr. L. Howe, Buffalo: We are very much indebted to the author for the way in which he has presented the negative phases of the effects of heat on the eye. We must keep clearly in mind the factors involved; that is, the resistance of the eye and the resistance of the bacteria if we expect to kill them. We now know definitely what the lethal point of the eye is. Bacteriologists are not so well agreed as to the lethal point of bacteria. When I prepared the paper three years ago which described for the first time this method of measuring the temperature of the eye by means of thermal junctions, I was rather surprised to find such a difference of opinion on this point among bacteriologists. At that time I asked Professor Ernst of the Harvard Laboratory concerning the lethal point of the gonococcus. He gave figures which made it quite sure that that form of bacteria could stand heat better than the eye. It is true we use heat when we cauterize, but over only a very small surface. The value of the measurement of heat does not relate to the higher temperatures. But as we find moderate heat of advantage clinically the practical point is to determine with delicate tests, like the galvanometer, what the exact temperature is of the applications we make. When that is done we can decide what class of cases are affected by increased temperature and in what way.

Dr. William E. Shahan, St. Louis: This method should not be confused with any electric method where the electric current heats the tissues by passing through them. In this method all unknown factors, except heat, have been eliminated, and the effects of this agent alone studied. Neither should it be confused with any application of heat approaching cauterization. Dr. Howe's remarks on the practical impossibility of getting accurate results with the use of the mercury thermometer alone are fully concurred in and indebtedness to him for his paper on the thermocouple at Minneapolis in 1913 ought to be fully acknowledged.

ORTHOPEDIC SURGERY IN WAR TIME*

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We are of the opinion that efficiency as it is generally understood should not be the goal of life. But we are also of the opinion that once a goal is set, it should be attained by the least expenditure of any energy which is worth saving, and we believe that this is what efficiency ought to mean.

In a physical conflict such as war, the goal of both sides is set. To attain it each must conserve the physical energy of its soldiers in order to increase their strength in battle. Each must strive for the complete recovery of its wounded in order that the ranks may be kept as full as possible. Finally, but perhaps most important of all in any long conflict, each must see to it that those large numbers who do not lose their lives, but who by reason of their mutilating wounds lose their fighting power, do not become a burden on the industrial community already depleted and vastly overburdened by the necessity of support of the armies in the field. The few left at home are doing intensive work, and the wounded heroes, if the national strength is to be conserved, must have a still further test of their heroism and be made to contribute their remaining energy to help maintain their still efficient comrades.

Our thesis is to be that orthopedic surgery has a very large part to play in (1) assuring physical efficiency in the ranks; (2) in conserving and restoring the function of the locomotive apparatus of the wounded; (3) in providing the physical possibility and perhaps reorganizing the means by which the war cripples may become happy, productive, wage earning citizens, instead of boastful, consuming, idle derelicts.

ORTHOPEDIC EXAMINATION OF RECRUITS AND SOLDIERS IN TRAINING

Posture.—It has not been, we believe, solely because of the better appearance presented by erect, full chested men, that all recruits are compelled to go through "setting up" exercises, and that good carriage is so strongly emphasized. Life insurance figures suggest that the number of inches of chest expansion up to certain limits is in direct ratio to the quality of the risk.

This important part of preventive work, namely, the acquisition and maintenance of a good posture, is surely essentially an orthopedic concern. It is well

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looked after at present by the trainers of recruits. It is possible if orthopedic help were sought that still more might be accomplished in the direction of simplification and more rapid attainment of the desired end.

Feet and Shoeing.—We are perhaps tempted to forget in these days of trench warfare that the feet of the soldiers are of supreme importance. The front must be reached often by forced marches. Railroads may supply men and provisions, but do not fight battles or push on as victory is gained. At the Battle of the Marne, an English surgeon, in charge of a hospital near the front by which the armies surged in haste, told me that in the early days there were constantly large numbers of footsore men in every company, sometimes 25 or 30 per cent. These men were inefficient, if not an actual burden.

Being impressed with the large numbers of nurses who had to be temporarily relieved of duty in the course of their training in a large general hospital on account of foot strain, the writer began many years ago to examine the feet of all probationers as a routine when the classes entered. Suggestions as to shoeing and any necesary immediate treatment, etc., were made on the basis of this examination, and on the basis of the muscle balance tests, by which potential trouble may be discovered. By this method it was possible to actually eliminate foot strain from the causes of disability among the nurses who followed instructions. In armies the soldiers *must* follow instructions.

We believe that careful tests of this sort would more than compensate for the time consumed by the discovery of potential but correctable faulty weight bearing and the assurance of more constant and continuous efficiency when severe tests came.

The American army shoes, as far as we have been able to ascertain, are vastly better than those of many other nations, and several of the so-called army shapes leave little to be desired. It was most satisfactory to pick out an unusually good shoe from among hosts of bad ones which the patients in a French hospital were wearing, and to find that this was an American shoe and was being supplied to certain of the French soldiers.

No care can be too detailed as to the fit, shape and quality of soldiers' shoes. Battles may be lost or won by shoes alone. In a questionnaire conducted by Dr. Smith Peterson and the writer at the American Ambulance in Paris, many more than half of the 200 soldiers under investigation had suffered from blisters and other more serious foot troubles caused by faulty fitting and faulty fashioned shoes. A man may not fight at his best with a blister on his heel.

ORTHOPEDIC SURGERY IN A BASE HOSPITAL

The opportunities for preventive orthopedic surgery have not ceased when the base hospital is reached. They have hardly begun. The wounds of the war are nearly all infected. Healing is delayed, and contractures and adhesions are almost certain to occur, unless these dangers are appreciated and future function striven for quite as strenuously as the healing of the wound.

Ankylosis, after joint injuries with their accompanying infections, is a very common and unfortunate sequela, but the degree of this misfortune depends on attention to the position in which the joint stiffens, and every joint may be said to have its position of choice. For example, a stiff shoulder in 45 degrees of abduction, an elbow in 90 to 100 degrees of flexion, a knee in 20 to 30 degrees of flexion, are often not serious handicaps, whereas an arm glued to the side, a fully extended elbow, a knee flexed to a right angle, represent actual crippling and require an operation or a forcible manipulation, which, because of the previously septic nature of the wound, may not be without serious risk.

I shall not discuss at length the problems of immobilization of joints and compound fractures of bones. These matters have been considered in some detail in a previous paper; but I would remind you that no surgeon should be as well qualified to deal successfully with these problems as an orthopedic surgeon. Mr. Robert Jones has his great orthopedic base hospital at Alder Hey near Liverpool, Professor Lange his German orthopedic base at Munich. Both these masters make trips to the front and instruct the surgeons in the orthopedic technic of splints and plaster, but unless we are much mistaken, in the other base hospitals of both these countries, and surely in the base hospitals which we observed in France, there is still very great opportunity for orthopedic endeavor, and this endeavor is sure to yield full compensation for labor.

In our own experience we found plaster of Paris most adaptable for immobilizing even the septic compound fractures requiring constant irrigation. Wide reinforcing bridges must, of course, span the open wound, and nice application must be had; but in hands familiar with its use it serves its purpose well. The ingenious splints of Mr. Jones, Dr. Joseph Blake and other surgeons are also most useful, and the overhead suspension, or so-called Balkan splint, often used in combination with metal splints, adds greatly to the comfort of the patient and often facilitates drainage.

Problems of Restoration of Function.—The return of function in wounded and infected joints depends on many things: first, of course, on the extent of the injury, and second, on the seriousness of the infection. We have been impressed by the power of repair which the ends of bones possess and also by the considerable amount of resistance which the synovial membrane displays.

It seems to us that conservatism should be practiced in regard to early excision of joints, and that multiple incisions and absolutely free drainage should be reserved for those cases which actually *do* need it. We do not believe in making these incisions and providing this drainage in cases which *may* need it. We are aware that occasionally we shall be sorry that we did not thus widely open and drain, but we are sure we shall many more times be glad when we simply wash out the joint thoroughly and leave only a tiny rubber tissue drain running into or down to the joint opening. Joint function returns very quickly and perfectly if the latter procedure is successful, very slowly, or not at all, after the former.

We need not emphasize the importance of massage and early gentle, active and passive motion to prevent the formation of permanent adhesions.

Brisement force, which is usually resorted to if these early movements have not been carried out, is a most unsurgical procedure, and only rarely successful.

There are now several very excellent universal mechanotherapeutic machines, both French and German, which, working on the principle of the pendulum, afford excellent opportunity for the slow but safe limbering out of joints and stretching out of muscular

contractures. The results which they accomplish are slowly gained, but they may be expected to be permanent and we know no shorter road.

Operative Orthopedic Surgery.—As the war progresses there will be no limit to the field of what may properly be called orthopedic operative surgery. There is ample opportunity for its practice now, but with septic compound fractures, in which wide gaps of bone exist, grafts are obviously not advisable until the sepsis has thoroughly disappeared, and in stiff joints all experience teaches that no attempt should be made to perform arthroplastic operations until long after the septic process has been quiescent, how long may be found to vary with different germs. Perhaps a year is not too long as a working rule.

Many limbs are saved now that formerly would have been amputated, both because it is more possible to save them and save life as well, and also because the supply of artificial limbs bids fair to be so inadequate for some time to come. In these limbs, position has often been sacrificed to life, and realinement will be necessary. A further task and opportunity for orthopedic surgery is thus presented. These are only a few of the tasks and opportunities.

ORTHOPEDIC WORK WITH CRIPPLES

Apparatus.—The cripple has a right to look to the orthopedic surgeon for an amelioration of his condition. Much may be done by preventive and restorative surgery alone; much more may be accomplished by the added use of apparatus of one sort or another, supportive, retentive or corrective.

The little book of Spitzy and Hartwich gives us an idea of the care with which these matters are being considered in Germany. Not only adaptations of the standard types familiar to all orthopedic surgeons are required, but also various forms of inexpensive prostheses are in constant demand for both upper and lower limbs. It would be hard to conceive of a more ample opportunity for exerise of mechanical ingenuity than that presented by the maimed limbs of the returning soldiers. Even if funds were at hand, which they are far from being, there is apparently a completely inadequate supply of the modern expensive and complicated and not always durable forms of artificial limbs. Once given the occupation, an inexpensive and adaptable makeshift can usually be planned and can be easily obtained.

Occupational Training.—This brings us to the consideration of the occupational training of cripples. It is fitting that orthopedic surgeons should take the lead in organizing this work, as they have done in the past and are doing now in Europe.

Here in America, although much has been accomplished, most of the cripples throughout the country are cripples still, and idlers instead of special wage earners. There can be no question as to which state of being is of greater use to the nation, or as to which state is the happier state for the individual. We should surely appreciate the importance of devoting much energy in our several communities to a rounding up of these interesting people and providing them, probably by state legislation, with vocational training. This is a form of preparedness of which every pacifist must approve.

We point with much satisfaction to a recent bill introduced into the Massachusetts legislature by Representative John L. Monahan and just signed by Governor McCall, the provisions of which are as follows:

Resolved, That the board of education is hereby directed to investigate and report to the next general court, on or before the second Tuesday of January, 1917, what facilities exist in this commonwealth and what provisions have been made to give special training and instruction to persons who have suffered the loss of sight or loss or injury of limb or member and whose earning capacity has been destroyed or impaired by such injury, for the purpose of reestablishing of increasing the ability of such persons to earn a livelihood, and also to investigate and report what provision has been made or opportunity furnished for such purposes of training or instruction in other states and in foreign countries, and to include in its report a statement of the opinion of said board on the advisability of action on the part of the commonwealth to establish or extend means for such training and instruction, and also to submit drafts of such legislation as they deem necessary to carry into effect their recommendations.

The American Orthopedic Association at its last executive session appointed a special committee, of which Dr. J. E. Goldthwait is chairman, to consider ways and means by which the orthopedic surgeons of the country may organize a national orthopedic reserve. Detailed plans of an orthopedic base hospital are being worked out and sources of supply assured. We urge most strongly the cooperation of this section, both officially and individually, with this committee. It seems to us of great national importance — how great it may be, we trust we shall never know. At the executive session it was recommended that a committee be appointed by the Chair, and Dr. Goldthwait was appointed chairman of this committee also.

We believe orthopedic surgery in times of peace is a most comprehensive specialty; in war time the possibilities of its helpfulness are still greater. The fact that these possibilities are not always recognized should make orthopedic surgeons seek opportunities to demonstrate them. If this opportunity is accepted it may well mark an epoch in the history of the specialty.

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ABSTRACT OF DISCUSSION

Dr. Nathaniel Allison, St. Louis: I succeeded Dr. Osgood at the American Ambulance last summer. In the early months of the war in Europe, I speak particularly of the French and Belgian sides, the hospitals were not adequately prepared, and the surgeons comprehended little of what they had to do. Supplies were not forthcoming. General surgeons, medical practitioners—all the leading men in France, were called to the colors, to serve in such ways as they could in inadequately prepared hospitals with no supplies. The American Ambulance was in a fortunate position, having an excellent building, unlimited supplies, and being able to spend on the care of the patient about five francs a day from the donations that were made for the hospitals. This is much more than can ordinarily be afforded in France. Mr. Frederick Villars, a war correspondent who has followed all the wars that have occurred in the last thirty years, said that the American Ambulance was the best military hospital that the world had yet seen.

The thought this brings up to us is what we would do for the care of tremendous numbers of wounded, if war should come suddenly on us. The more or less of a catch word we all are using, "preparedness," is apt to be only a catch word, unless things are taken quite seriously. These men come in in hundreds and thousands, and they must be taken care of, and their wounds are of the most severe character. The American Ambulance, in its first year, treated three thousand patients, with a death rate of 8.8 per cent. This compares very favorably with any municipal hospital. In the first year they did only eighty amputations. That shows what orthopedic surgery—the hospital was practically an

orthopedic hospital—has done. No one thought of anything but conserving the limbs to the best function that could be obtained for them. Everyone tried to devise means to conserve them, and in that way, these very original and valuable appliances that Dr. Osgood has shown you have come into use.

Some provision should be made in this country for taking care of tremendous numbers of wounded. I hope that we shall never have need to have such measures put into effect; but if we should, the need will come suddenly and not after months of preparation. The American Orthopedic Association, to this end, appointed at its meeting in Washington, D. C., a committee to standardize some notion of what orthopedic surgery could do in case such a condition should arise with us, and I would suggest that this section might also appoint such a committee.

DR. EBEN W. FISKE, Boston: My experience was, perhaps, a little different from that of Drs. Osgood and Allison. Dr. Osgood said that preventive orthopedics had hardly begun when the base hospital was reached, and this is very true. But on the other hand, orthopedic surgery is as essentially prophylactic as it is reconstructive, and nowhere is this truer than in its application to the surgery of war. How large a proportion of the cases in Europe which are today requiring late treatment for deformities were preventable no one can say. Of course, lack of time and material, and the presence of wide-spread infection, make it very difficult to carry out these measures; yet even with the first dressings certain knowledge of the mechanics of fractures must be employed, and all the way back, long before the base hospital is reached, there are innumerable opportunities for the application of orthopedic principles toward the prevention of deformity and the preservation of function. Naturally in the most severe injuries we must first preserve the limb, if not the life, with the establishment of full drainage. Second in importance is immobilization, and lastly, alignment and orthopedic principles. In the moderate injuries, however, which furnish the largest proportion of cripples, we can do a great deal. It is as easy, for example, to put up a wrist in dorsiflexion as in any other way, yet it is not always done. Again, among the minor injuries, the necessary rest and relaxation of the exact structure damaged, to be obtained by orthopedic measures, is greatly neglected, although this would often prevent the patients' transfer back to the base, a matter of extreme importance in keeping the maximum number of men in active service. Dr. Osgood advised the use of plaster-of-Paris and I think from his experience he is fully justified. But in many of these early purulent conditions, it has been the experience of many good observers that splints are superior to plaster because, provided the immobilization is perfect, the splint is usually cleaner and gives more chance for drainage and dressing; it allows observation of the limb for spread of infection or gangrene and control of the secondary hemorrhage, and for early massage and manipulation. But the choice of the splint is very important. Traction and coaptation together are undoubtedly the ideal method of putting up fractures of the extremities, but traction with the body weight as a counterforce is not ideal, because every movement of the body creates spasm, so prejudicial to the comfort and safety of the patient. Pull and counterpull within the splint is ideal and is so used throughout the English army, after the Thomas method. It is also adapted to the arm, with the counter-pressure by a padded ring against the chest wall. A material now generally used is an aluminum alloy rod, which can be easily bent, cut or spliced, and can take the place of any splint, even the Thomas. I want to call this splinting to your attention, because I feel that orthopedic surgeons in this country should be familiar with a material that is so universally applicable and valuable in war surgery.

DR. J. D. GRIFFITH, Kansas City, Mo.: I want to second the suggestion Dr. Allison made that we should have a committee appointed from this section, such as was appointed from the American Orthopedic Association, for the purpose of helping us in being prepared for an emergency. To one who has been along the line the absolute unpreparedness of this country is apparent. We ought to be prepared thoroughly.

DR. JOEL E. GOLDTHWAITE, Boston: The committee of the American Orthopedic Association was appointed with the idea of trying to standardize, or decide what is the best equipment for an orthopedic base hospital, or what material should be used in any hospital unit which might be established, whether a general or special orthopedic unit. It was also thought possible to have the members of the Orthopedic Association and all the men in the country who are interested in orthopedics get together, so as to be made available for service in case of need. The committee consists of Drs. Allison, Henderson, Forbes, Erving and myself. Already General Gorgas has been written to, and the plan put before him, and he is most cordial in his wish to have the thing go on. It is a part of the committee's expectation after they have worked out what is necessary for an equipment of a unit, to have such collections of material stored in different parts of the country ready for use, these storage places to be known to the National Academy, and also to the army. All of us must feel that the great need is for our doing something that will put us in a position very different from what most of the nations abroad were in when the war began. Then too, it is not only in the time of war that opportunities of this kind are available. When the war is over there will be an opportunity to get orthopedic experience, for hospitals are being established to help those who have been crippled. It is the hope of the committee that any of the men here wishing to join an orthopedic unit will communicate with the committee. The committee will send letters to all those doing work in our specialty; but in case they should not hear on account of error in the mails we should like them to send a statement of their age, experience, whether married or not, etc., to the committee. We can have the names classified so that the government will have men fitted for different kinds of service. Some could go to the front, others could go to the base units. It will help the committee if you will do this.

A PLAN OF TREATMENT IN INFANTILE PARALYSIS *

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The successful treatment of infantile paralysis requires that the surgeon should have in his mind a definite plan covering all the phases of the disease, a plan based on the pathology in its various phases. We have at the outset a virulent acute affection with a high mortality, then comes a period of two years during which we try to restore to their highest efficiency the affected muscles, and finally we meet in the later and so-called stationary stage of the affection the question of correcting deformity and restoring or improving function by operative measures. Few affections offer a wider range of requirements from a therapeutic point of view, and if when we are treating the first stage we bear in mind what may happen to the patient in the third stage, we shall treat the early stages better.

The muscle test spoken of in the paper is a means of quantitatively estimating the strength of muscles by means of their pull against a spring balance, and is not only useful in locating the existence of weakness in different muscular groups, but offers a means of estimating the gain or loss in muscular strength under given conditions.[1]

The stages of the disease are as follows:

1. The stage of onset begins with the acute attack, and may be assumed to end when the tenderness has

* Read before the Section on Orthopedic Surgery at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Martin, E. G., and Lovett, R. W.: A Method of Testing Muscular Strength in Infantile Paralysis, THE JOURNAL A. M. A., Oct. 30, 1915, p. 1512.

disappeared, a duration in general of from four weeks to three months. A hemorrhagic myelitis is present, widespread, and affecting chiefly the centers of motion. The centers of sensation are also involved, the posterior root ganglia in experimental pathology showing the first changes, and the existence of tenderness must be accepted as evidence of an active process in the spinal cord. During this tenderness it is not physiologically reasonable to excite the peripheral connections of the affected nerve centers by massage and electricity. The former at times causes great increase of pain and soreness, and has nothing to recommend it at this stage, and there is no evidence whatever to show that electricity is of any value at this stage. Rest is the physiologic requirement, and the method of treatment that in practice works best, and the growing tendency to omit meddlesome therapeutic measures at this stage is hopeful. There is evidence that the use of hexamethylenamin in monkeys diminishes the risk of infection, but has no effect after the paralysis has occurred, and as the drug in moderation is harmless, it is extensively used in this stage. There is no serum or drug or proceeding that is known to abort the affection or limit the paralysis, although Netter of Paris has administered intraspinal injections of the blood of recovered persons with, he believes, benefit, but only in a small series of cases, and the proceeding is as yet wholly in the experimental stage.

During this stage the patient should be kept quiet. Joints will not stiffen, hopeless muscular atrophy will not occur, and by this proceeding the damaged cord will have the best chance to repair, and repair to the highest degree is desirable.

Deformities should be prevented by keeping the feet at right angles to the legs to avoid the most common deformity, a dropped foot. Toward the end of this period immersion in a warm salt bath is desirable and permits a degree of exercise to the affected limbs. Scoliosis begins frequently in this stage, and is often overlooked.

2. The second stage, or phase of convalescence, may be assumed to begin with the disappearance of the tenderness and to last for two years or more, at the end of which period the disease has become more or less stationary. The pathologic condition at this stage formulates the treatment. The hemorrhagic myelitis is subsiding, the perivascular infiltration which has blocked some of the spinal arteries is being absorbed, and these cells are resuming their function little by little, inflammatory products are being absorbed, and the clinical manifestation of these processes is expressed in what we all recognize as "spontaneous improvement," which begins when the tenderness disappears and lasts almost indefinitely, diminishing in its rate as the months pass.[2]

The clinical manifestation of the pathologic process is a motor impairment of muscles, widespread and in general erratic, more often a weakening than a complete paralysis. In the Vermont series of cases,[3] manual examination of muscles showed the proportion between partial and total paralysis to be as 2½:1, and the more delicate muscle test,[2] which detects slighter grades of weakening, found the proportion to be as 9:1.

Our problem at this stage therefore is to restore the maximum function to affected muscles, and to study carefully the measures most likely to accomplish this end. This point of view becomes especially important when we realize that muscular weakening is much more common than complete loss of power. It is a very important matter to the patient with a gastrocnemius muscle with only 20 per cent. of the normal power whether that muscle ultimately regains 40 per cent. or 90 per cent. of its proper strength.

It becomes necessary then to consider those measures which are likely to prove most useful in bringing about the maximum improvement, and to comment on conditions likely to prove detrimental.

AMBULATORY TREATMENT

When the acute stage is over it is on the whole desirable to get the patient on his feet, that is, to institute ambulatory treatment. Prolonged recumbency is for a child unnatural and undesirable physiologically and mentally. The sitting position not varied by the upright position is of all most likely to lead to flexion deformity of the hips and knees and to dropped feet. The upright position induced by ambulatory measures is desirable not only because it antagonizes the conditions mentioned, but because the effort to balance on the feet instinctively excites to effort a large number of muscles not otherwise to be reached, and is a valuable form of "muscle training," a therapeutic measure to be mentioned later. On the other hand, this method is open to the objection of possibly fatiguing convalescent muscles and some authors advocate prolonged recumbency. In my opinion, the ambulatory method with proper avoidance of fatigue is on the whole the best to be pursued at the end of two or three months.

If the patient can walk without braces, so much the better. If apparatus is needed to permit ambulatory treatment it should be used, but worn only in walking and in early cases not continuously. The most commonly required form of apparatus is the Thomas caliper splint, which serves to keep the knees straight. Crutches may or may not be required. A good general rule with regard to apparatus is that it should be used when the patient cannot stand without it, or if in standing or walking a position of deformity is assumed, because deformity leads to stretching of soft parts, and if persisted in to permanent bony changes.

The two conditions most frequently overlooked which lead to serious results are weakening or paralysis of the abdominal muscles and scoliosis. In the writer's opinion when these occur the use of a cloth corset or plaster jacket is imperative from the time that the first stage is over.

A patient who has been long in bed when first put on his feet is often unable to balance even if he has sufficient muscular strength, and the problem of cultivating equilibrium in these cases must be taken up by itself and patiently persisted in.

Having thus formulated the matter of ambulatory treatment, the question next arises as to those therapeutic measures which are likely directly to have a favorable effect on the muscles. These are (1) massage, (2) electricity, (3) heat, and (4) muscle training.

1. Massage is of value because it empties the veins and lymphatics and thus promotes the flow of blood to the limb, and because it apparently retards muscular atrophy and promotes muscular tone. More than this, however, is not to be expected of it. It does not promote the passage of nervous impulses from brain to muscle, and its action must be considered purely local. Given roughly or for too long a time it is detrimental

2. Lovett, R. W., and Martin, E. G.: Certain Aspects of Infantile Paralysis, THE JOURNAL A. M. A., March 4, 1916, p. 729.
3. Lovett, R. W.: The Treatment of Infantile Paralysis, THE JOURNAL A. M. A., June 26, 1915, p. 2118.

and retards progress, and its overuse is probably responsible for much harm.

2. Electricity has been much discussed, and in the absence of definite data one must fall back on personal experience. Faradism causes a mild muscular contraction, and may be a useful form of gentle exercise. It is disagreeable, and to young children often a source of terror. The galvanic and newer forms of currents are assumed to have a beneficial effect in general, but in many years' experience in treatment with and without electricity (used often on one side of the patient only with the other side as a control) the writer has never been able to satisfy himself in a single case that it was of any value. Certain recent experimental work on the retardation of atrophy in denervated muscles is of interest:[4]

> It is practically certain that if electrical stimulation has a beneficial effect, the optimal effect will be with that current which is strong enough just to cause contraction. In the ordinary methods of stimulating muscles through the skin, whether by unipolar or bipolar methods, with currents of long or short duration, the intensity of the current is much greater in the superficial than in the deep fibers, and we think it doubtful whether the latter can be stimulated without using currents injurious to the former.

That the use of electricity has done much harm is undoubted, because not only is the use of strong currents admittedly injurious, but the routine use of electricity often deludes the physician and parents into thinking that the child is receiving adequate treatment while measures of admitted value are neglected.

3. Heat is of value either as radiant heat from electric bulbs or by some form of oven, because it raises the temperature of the limb, and thus offers more favorable conditions for muscular contraction, and because it stimulates the flow of blood to the limb.

4. Muscle training is in the writer's opinion the measure of the greatest value at this stage, and this stage is important because however operative the surgeon may be he will during these two years use nonoperative treatment.

Muscle training attempts to drive an impulse from brain to muscle to enable it if possible to open up new paths around affected centers in the cord. The connection between these centers with each other and between the centers and the muscles is most extensive and complex,[5] and the facts given as to the predominance of partial paralysis show that as a rule the entire nervous control of a given muscle is not wiped out as a whole, but only in part. On this basis rests the claim of muscle training, a measure which in the opinion of the writer is one of the most powerful factors in determining ultimate muscular function.

As to the efficacy of this treatment, the following data were observed in Vermont by means of the muscle test. The period covered was three months:

> The chance of improvement in affected but not totally paralyzed muscles under expert treatment by muscle training was about 6 to 1, under supervised home exercises 3.5 to 1, under home exercises without supervision 2.8 to 1, while untreated affected muscles in these patients showed an improvement ratio of 1.9 to 1. These figures represent cases at the end of the first year. They are all from the Vermont group and were treated there.

In order to determine just what might be expected from the treatment by muscle training an analysis was made of the progress of all patients in my private practice during the past winter who had had two successive muscle tests at times widely enough separated to warrant any conclusions as to their progress. No cases were omitted, and the patients, as indicated in the accompanying table, are divided into two classes, those coming daily to the office for treatment by an expert assistant, and those whose treatment by muscle training was prescribed at the office but carried out at home by some unskilled person.

One difficulty presented itself in the analysis. Certain cases were regarded as having no power at all at the first examination, and in these cases for purposes of computing it was assumed that the children had power of one-eighth pound, not sufficient to move the scale. It was found that a child with one-fourth pound of muscle power would, however, move the scale, and these were the ones that were noted at the initial observation as having a trace of power. The percentage gain of each muscle was then reckoned, and the figure given in the table represents the average percentage of gain of all the muscles. If the paralysis was unilateral, the per cent. of gain in the unaffected limb was deducted from the gain of the affected side and only the excess counted.

RESULT OF MUSCLE TRAINING

Age	Time Since Attack	Interval Covered by Tests	Average Total Gain of Affected Muscles, per Cent.	Average Monthly Gain of Affected Muscles, per Cent.	Apparatus Worn	Region Recorded
Patients treated daily at office by skilled assistants						
22	1 mo.	6 mos.	197	24	Sling	Arms
8	3 mos.	5 mos.	82	16	Corset, crutches, braces	Legs
9	3 mos.	6 mos.	146	21	None	Legs
9	21 mos.	10 mos.	200	20	Plaster jacket, crutches, braces	Legs
14	4 mos.	4 mos.	688	172	Corset, braces, crutches	Legs
8	15 mos.	7 mos.	702	100	Corset, braces, crutches	Legs
8	3 mos.	6 mos.	184	30	Corset	Legs
Patients treated at home by relatives or nurses (unskilled)						
10	1 yr.	6 mos.	13	2	High heels	1 leg
30	5 mos.	1 mo.	44	44	Sling	1 arm
24	6 yrs.	3 mos.	12	4	None	1 leg
10	2½ yrs.	8 mos.	108	13.5	Corset, plate	1 leg
11	6 yrs.	5 mos.	89	17	Plaster jacket, braces	Legs
4	1 yr.	7 mos.	30	4	Brace	1 leg
11	9 yrs.	2 mos.	33	17	None	Arm and leg
10	3 yrs.	4 mos.	16	3.5	High heel	1 leg
10	5 yrs.	7 mos.	None	None	High heel	1 leg
14	8 yrs.	8 mos.	67	8	Plaster jacket, brace	1 leg
16	2 mos.	3 mos.	620	206	Brace and crutches	1 leg
8	1 yr.	7 mos.	202	28	Braces and corset	2 legs, 2 arms

Deformity occurs in many forms, but the therapeutics of it are easily formulated. In the earlier stages it is generally to be avoided by preventing persistent malposition. If fixed deformity exists it must be removed before undertaking treatment, nonoperative or operative. The neglect of this rule is one of the most frequent causes of failure of treatment. Deformity is corrected by stretching by hand, by plaster or by apparatus, by forcible stretching under anesthesia, by tenotomy, fasciotomy, myotomy or osteotomy, the mildest measure that will suffice being the soundest and best.

4. Langley and Kato: Jour. Physiol., 1915, xlix, 432.
5. Bing: Compendium of Regional Diagnosis in Affections of the Brain and Spinal Cord, New York, 1909.

Stretched muscles are at a great disadvantage so far as recovery goes, as pointed out years ago by Charles Fayette Taylor, and later by Robert Jones. The best example of this is in gastrocnemius paralysis, most efficiently treated when it exists alone by very high heels, throwing the muscle out of use and preventing stretching.

Fatigue and overtreatment by massage and exercises are detrimental factors of the highest importance too little attended to. This has been especially brought out by the studies by means of the muscle test, which have shown that a surprisingly small amount of exercise was detrimental to convalescent muscles, and in some muscles returning power has been wholly abolished by overuse. The advice often given to use affected limbs as much as possible is in the opinion of the writer the worst advice that can be given. It is difficult to underuse such muscles, but fatally easy to injure them by overuse.

3. The third stage is generally called the stationary stage, and begins about two years after the onset. The requirements of the preceding stage as to the care of the muscles, etc., still exist, but are less urgent. In cases which have not been properly treated earlier, muscle training may accomplish much, even in cases of long duration. The requirements as to apparatus remain much the same throughout.

The dominant requirements of this stage are operative, and are first the correction of deformity, a matter already discussed, and second, operations to improve function and secure stability.

Operations to improve function are by all experienced surgeons deferred until at least two years after the onset (and by some men several years) in order to permit recovery of muscular power to become as great as possible and to enable the mechanical conditions in the affected limb to become clearly defined before operating.

Tendon transplantation[6] is the most brilliant of these measures. It implies the existence of one comparatively normal muscle in the region to be operated on. Simple operations have replaced complicated ones, periosteal insertion is used, silk extensions are in common use, tendons are passed in the subcutaneous tissue, and prolonged after-treatment is the rule, unrestricted use not being allowed under one year from operation.

Nerve transplantation,[7] which is the other operation to improve function, has not been generally used because the most skilful operators in this field have not reported a large proportion of satisfactory results, and also for the reason that the operation is advised at so early a period in the disease.

OPERATIONS TO IMPROVE FUNCTION

Arthrodesis[8] has lost favor because of the entrance in the field of operations yielding better functional results, and the most experienced surgeons do not favor it in the ankle until after late childhood, if at all. At the knee it is always questionable and dangerous in early childhood. In the hip it is desirable, but often unsuccessful.

Astragalectomy,[9] on the other hand, has gained in favor, and although originally introduced by Whitman only for talipes calcaneus, it is now widely used where arthrodesis would formerly have been performed. A transverse section of the foot devised by Davis[10] deserves mention as being useful in calcaneus deformity.

Silk ligaments[11] are used because silk left in the tissues becomes coated with fibrous tissue and serves as a ligament. This is especially used to correct the dropped foot by passing several strands of silk anteriorly from the tibia to the tarsus. It is a brilliant operation when successful, but has often failed, probably because too little silk has been used. In a child of 8 or 10 one should use six to eight strands of No. 12 silk.

Tendon fixation[12] or tenodesis has lately been revived by Gallie, and is extensively used. The paralyzed tendons are sewed into grooves in the bone, thus being transformed into ligaments, to correct deformity and check excess of motion. Stretching may occur, but the operation seems to have a field of usefulness.

Two of these operations are frequently combined, as, for example, tendon transference and silk ligaments, and similar instances.

SUMMARY

This paper is a plea for a definite uniform plan for the treatment of infantile paralysis in all of its stages, for a direct attack on the disease based on its pathology, and for persistency and precision in that therapeutic attack, with special care as to the avoidance of fatigue from overexercise or overtreatment. It is the belief of the author that nowhere in orthopedic surgery does the difference between the best and indifferent treatment have more effect on the ultimate result than in this disease.

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ABSTRACT OF DISCUSSION

Dr. E. W. Ryerson, Chicago: There is no question about the value of the muscle training as advised and perfected by Dr. Lovett. It is, however, unfortunate that so desirable and important a method of treatment should be so difficult to apply in most of our large clinics. It is not so difficult in private practice, where we have specially trained and paid assistants; but it is very hard to obtain voluntary service in our free clinics. For that reason, in my experience, this method of treatment has been very much neglected. The use of electricity has been, very properly, frowned on by the author. His experience corresponds exactly with my own. While electricity will always assume a certain position in these cases, because we hope that it may do some good, I know of no one who has done much practical work in this line who will enthusiastically claim very much value from its use.

The operative treatment, as described by Dr. Lovett, is of great importance; for the reason that we shall always be confronted with a large number of cases in which no other method of treatment has been used, or perhaps could be used. I formerly advocated the use of silk in the form of ligaments and tendons. During the last few years, however, I have not been so confident that this was the ideal method of treatment; for the reason that there is a certain element of uncertainty in the use of silk. I have seen cases in

6. Lange: München. med. Wchnschr., 1902, No. 1; Ztschr. f. orthop. Chir., xxix; Ztschr. f. ärtzl. Fortbild., 1905, 22. Vulpius: Deutsch. med. Wchnschr., 1912, xxxvi. Lovett: Boston Med. and Surg. Jour., 1910.

7. Spitzy: Handbuch der Kinderheilkunde, Lange and Spitzy, Leipzig, 1910, p. 310; Ztschr. f. orthop. Chir., xiii. Osgood (review): Boston Med. and Surg. Jour., June 30, 1910. Vernicchi: Arch. di ortop., 1910, xxvii, 337. Kilvington: Brit. Med. Jour., April, 1907. Deroux: Lyon chir., December, 1912.

8. Jones, Robert: Tr. Int. Cong. Surg., 1909, xvi.

9. Whitman, R.: Ann. Surgery, February, 1908; Am. Jour. Med. Sc., November, 1901.

10. Davis, G. G.: Am. Jour. Orthop. Surg., October, 1913, p. 240.

11. Lange: München. med. Wchnschr., 1906, li; Ztschr. f. orthop. Chir., xvii, 266.

12. Gallie: Am. Jour. Orthop. Surg., January, 1916.

which the silk acted as a foreign body—perhaps very long after the operation—and had to be removed, and in which the fibrous tissue that had been deposited around the silk was apparently not strong enough to do the work that we had expected the silk to do. Hence, we are inclining toward tendon operations and fixation, especially in the line of astragalectomy. This, in the field of marked deformity, will always be the routine treatment, combined with tendon fixation and tendon transplantation.

DR. H. W. FRAUENTHAL, New York: Some years ago, I started an orthopedic clinic in New York in which I treated bad cases of infantile paralysis of more than three years' duration. Many men are not sufficiently familiar with what massage and electricity can do, when you do not overdo it. In the last year, I have had as patients a number of adults who had been troubled for more than ten years, and I hope to show the result at the next meeting of this section.

DR. F. C. KIDNER, Detroit: I, too, was very enthusiastic about silk ligaments three years ago, but I became less enthusiastic as time went on. I still believe, however, that they have a very useful application as a help or a steadying factor, for a few months, in connection with massage, electricity and other forms of treatment; but I do not believe that they hold very strongly.

DR. A. H. FREIBERG, Cincinnati: In reference to tendon fixation, we should go slowly. The lesson that we should have learned in connection with our experience with silk ligaments is that caution should be observed in selecting this method of treatment. The gentlemen who have just spoken have referred in the past to the very definite value of silk ligaments, and are now retracting these statements. I wish to confirm what Dr. Lovett said about the use of massage and electricity. Every doctor who buys an electric battery tries electricity; but I am convinced that electricity, in itself, is an agent of no value in bringing about recovery or even considerable improvement in these cases. On the other hand, I am convinced that massage is of value; but I am also convinced that its value is not to be compared with that of muscle training. The latter, however, has to be administered properly to be of benefit; and this demands experience.

DR. F. J. GAENSLEN, Milwaukee: I have done a number of cases of silk-ligament suspension, and in two of them there occurred a fracture of the tibia at the point of insertion of the ligament. In one case, the silk had torn; and a subsequent silk ligament suspension was done, a long time after the first. At the second operation, the drill-hole was placed a short distance above the first hole; but, following a slight trauma, a fracture occurred near the point of insertion. The roentgenogram seemed to show osteoporosis about the point. In another case in which there had been only one drill hole, the fracture also occurred at that point. I suppose that osteoporosis was responsible for it, and wonder whether others may not have had the same experience.

DR. A. L. FISHER, San Francisco: Three years ago I had the same feeling in regard to the value of electricity as those who have spoken, but I have since seen the results secured by a man who had paid great attention to this method of treatment in Paris. He uses a very weak interrupted galvanic current. This does not seem to be important; yet in the two groups, treated prior and subsequent to three years ago, there is a contrast that shows that there is great benefit from this method of treatment. Another, and more important method of electric treatment to use is the faradic current. By it, you can get an idea of the quantitative amount of the muscle strength, by using a given coil and getting the minimum amount of current that will elicit a response to the unaffected side and treating the affected side, using the same amount of current. The proportion of muscle damage is practically in inverse proportion to the amount of current that it takes to get a response. This, in the way of prognosis, is extremely important.

DR. J. T. WATKINS, San Francisco: I have not had any success at all with the use of galvanism and faradism. With regard to muscle building, people living in the South and other disant parts of the country cannot go to New York for this training; so the work has to be turned over to persons who are sometimes expert, and sometimes not. My experience is that the people who had been trained in Christiania or London, when dealing with very young children, got practically no results from muscle building. They did not seem to be able to convey to the children what was needed, so that they could do it themselves by mental impulses. On the other hand, when dealing with older persons or adults, they obtained very remarkable results.

DR. WALTER G. STERN, Cleveland: Believing as I do in the value of massage and muscle training and also that overuse and overstimulation of the weakened muscles are especially harmful, I hold that Dr. Lovett is incorrect in his advice to us and through us to the general practitioner "to put the patient on his feet as soon as the acute symptoms have subsided," because when you allow this you allow him to run the dangers of overuse and overexertion. The patient makes his own efforts at walking, is stimulated by his parents to make further efforts and by the neighbors and friends to make still further attempts. These efforts are all made through the contracture of the strong and healthy muscles, which increase in proportionate strength to such an extent that soon overstretching of the weakened muscles takes place and they lose their tone. This is one of the chief causes of deformity which we find so difficult to overcome later on. Children should have, at least, a considerable period of rest after the acute stage, and during this time one can use muscle training and massage to good advantage. The late Dr. Townsend told us a few years ago that his best results in the first epidemic in New York were obtained with children who had been kept in bed for at least a year; Judson says eighteen months to two years, but that seems to me to be entirely out of the question. However, I believe that they should be kept quiet for a much longer period than Dr. Lovett would have us infer from his printed statements.

DR. W. R. MACAUSLAND, Boston: I agree thoroughly with Dr. Lovett's outline of conservative treatment, but I object strenuously to a statement made by him that the results of tendon transplantation and silk ligament fixation are "brilliant." These infantile cases demand stability and increased function. I have seen silk ligaments that have produced deformities by holding too strongly or insecurely, and an endless number of tendon transplantations that have not held, so that the part was weaker than before the operation and the patient was distinctly hurt by the tendon transplantation. I feel that, with the exception of about one transplantation in the foot, there is but one operation to be done in these cases of infantile paralysis that can stand the test of time; and that is astragalectomy, as outlined by Dr. Whitman.

DR. CHARLES A. PARKER, Chicago: I believe that every man does the best work in his own hobby. If he believes in operations, he gets the best results with them; if he believes in the use of electricity, or in massage, or in a combination of the two, he gets the best results with them. Most of the deformities are in the lower extremities in infantile paralysis, and the best result that we generally get, after the patients have lost the finer movements, is to teach them to stand on and use their feet and legs for the support of their body. In considering these different operations, one sometimes loses sight of the fact that the body should be straight, in order to be stable. The body should be straight over the hips, the knees straight, and the feet at right angles. These three conditions are the factors leading to the best results. How to get them is answered differently by different men. Some prefer tendon transplantation; some, astragalectomy, and some, other means.

DR. FRANK E. PECKHAM, Providence, R. I.: What do we want to obtain by our treatment? I may be wrong; but, personally, I feel that I want a fresh influx of blood to the paralyzed muscle. How is that best obtained? It has been held as an opinion that we could not do much until the pain stage had passed; but I have found that I could begin

treatment in the acute stage just as soon as I could have the child brought to the office. I have begun even before the fever had subsided entirely. You commence immediately by treating with applications of heat. I use a five hundred candle-power electric lamp for twenty minutes, and I apply mechanical stimulation by vibration. There is no pain caused by the treatment, and there is entire relief from pain in five minutes after the treatment is started. The relief lasts for a while only; repetition of the treatment, however, makes it permanent. I find that the cases improve faster in that way than when this method is not followed.

In regard to electricity: There are so many ways in which electricity may be applied that it is not fair to say that electricity is of no value without specifying just what method of application is meant, any more than it would be to state that drugs are useless without mentioning which drugs are referred to. The use of electricity is understood by the general practitioner to produce muscle contractions. Personally, I have not done that with it. I think that electricity has a use, but we must decide just what we want to accomplish and then accomplish it. The whole process should be stated in absolutely definite terms.

Dr. Roland Meisenbach, Buffalo: I wish to lay stress on the value of apparatus in connection with cases of infantile paralysis, even in the earliest stage. By a careful adjustment of the proper apparatus, one can assist muscles to return to their normal more quickly than without. However, before the apparatus is applied, we must keep in mind the actual condition of the muscle, not only at the time when the apparatus is applied, but in the course of the paralyzed or paretic muscles. The opposite can also be said about apparatus that is applied without any understanding of the muscle action. I have seen an entire quadriceps regenerated in a child, and I know it was due to the fact that a duralumin brace had been applied properly and so regulated from time to time as the muscles became stronger that the opposing group of muscles had no opportunity to check the progress of the quadriceps. Therefore, one should not apply apparatus unless he has a very thorough understanding of the individual muscular action. Dr. Lovett said that operation should be postponed until the third stage. I believe it is true. I think it is wrong to operate in the early stage. The insertion of silk is not the proper method of treating infantile paralysis, for two reasons: First, because it is not permanent; second, because it may check muscle exercise, and therefore prevent regeneration of one or a group of muscles. There is no question that silk resolves. If any one of you has had an opportunity to study cross sections of silk strands embedded in living tissue, you will see that after twenty days there is very little silk left, and in its place is connective tissue. I am taking out many more silk ligaments than I am putting it.

I firmly believe that apparatus, if applied carefully with Dr. Lovett's idea of muscle education in mind, will give better results. Stability is to be desired. You cannot immediately get stability by operative procedure. Where the attack of infantile paralysis is very mild, I have applied rubber muscles, as I chose to call them. These could be adjusted in thickness and width corresponding to the afflicted muscles, whether they were in a state of paresis or total paralysis. These acted as apparatus, and were sometimes combined with apparatus, especially in the early stage of infantile paralysis. The rubber tissue over the involved muscle acted also by causing a hyperemia, and thereby stimulating circulation. I cannot agree with Dr. Lovett in his statement that the pathology of infantile paralysis changes so rapidly for the better. I would like to ask Dr. Lovett whether the afferent and efferent impulses have much to do with the rapid rebound in cases of infantile paralysis, and whether he can tell the percentage of gain in the given paralyzed muscle in, let us say, six months of paralysis.

Dr. Robert W. Lovett, Boston: I do not want to go on record as advocating extreme conservatism in the treatment of the disease. If we can avoid operation, so much the better. Dr. Stern's criticism about getting the patients on their feet is a just one. I intended to protest against allowing children to sit in a chair, month after month, and did not mean to imply that there should not be considerable rest. In many cases, I do not allow walking at all. I am satisfied that the element of fatigue is of great importance in all early cases, and I am getting better results since I have been paying greater attention to it. I did not mean to advocate the insertion of silk ligaments over the other operative measures, but only as one of the operative procedures. I have had failures in cases in which I have used it. I now put in from six to eight strands of No. 12 silk. I do not know how this will work out in the end. I hold no brief for it over astragalectomy. It often has failed, but its results have often been brilliant. The muscle test gives a quantitative test of muscle strength. I believe it to be reliable. I have been able to treat the cases better, because I could take tests of them in that way. I believe that it is the means by which the question of the benefit of electricity can be settled. I am starting on the observation of a set of cases treated with and without electricity in order to compare the two sets by quantitative tests. Nine patients out of ten in my private practice during the last winter have had their muscle training under the mother or an untrained nurse. The results under these circumstances were about one third as good as when given in my office by an expert.

I must differ with Dr. MacAusland about tendon transplantation. I think it is a very good and at times a brilliant operation, although there are failures from its use; but the same may be said of astragalectomy. I think that astragalectomy is suitable for one set of cases, while tendon transplantation is suitable for another set. Tendon transplantation is especially suitable for cases in which you have tested the muscles and know just what you are doing. Of course, if you substitute a very small muscle for one that is strong and heavy there is nothing in it; but if you test out the muscles beforehand, you can avoid this. Therefore, this muscle test is in the line of precision. It has shown me how little I knew about the disease. Dr. Meisenbach's questions I cannot answer. The tendency of my paper is not to advocate any particular method. I merely wished to state my personal experience and to make a plea for a greater precision in the treatment, advocating a plan based on the supposition that there will be two years of nonoperative treatment. What operative treatment we should employ is a separate question.

SPECIFIC TREATMENT OF INFANTILE PARALYSIS

PRELIMINARY NOTE

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Epidemics of infantile paralysis since 1907 have afforded opportunity for careful clinical as well as laboratory study. In the present epidemic of infantile paralysis in New York, large numbers of patients with acute cases have been removed from their homes to the city contagious hospitals. In the Kingston Avenue Hospital at the time of this writing there were over 300 patients.

As a member of the committee in charge of these cases, assigned in charge of the treatment during the acute stages, I had a particularly good opportunity to select different types of the disease at different stages, and to make comparative observations which helped in deciding the value of the different treatments.

It is manifestly difficult to speak with any certainty of the value of any curative treatment in a disease like infantile paralysis in which early diagnosis in the preparalytic stage is difficult, often impossible, and in which the mortality is relatively low.

Our active treatment heretofore has been purely symptomatic. Anything based on sound rationale,

which properly used should do no harm, and which should theoretically do good is worth using, at least till we get something better.

The analogy, etiologic, pathologic and epidemiologic, between infantile paralysis and epidemic meningitis is very close. The symptoms of infantile paralysis, as in epidemic meningitis, may be grouped into those caused by (1) hydrocephalus; (2) the inflammatory reaction in the meninges and nerve substance, and (3) paralysis — due to focal involvement of nerve tissue.

The successful treatment of epidemic meningitis depends on the proper relief of hydrocephalus, and the injection into the spinal subarachnoid space of an immune serum which bathes the inflamed parts, produces a local leukocytosis and through its opsonins causes a sharp phagocytosis.

Treatment along similar lines should theoretically be of value in infantile paralysis.

The treatment of infantile paralysis may be divided into: (1) relief of hydrocephalus; (2) intraspinal injection of serum, normal human, normal horse, or convalescent; (3) control of special symptoms, as respiratory paralysis; (4) symptomatic general treatment, and (5) orthopedic treatment.

1. RELIEF OF HYDROCEPHALUS

Hydrocephalus with its pressure symptoms is most pronounced during the acute stage. In most cases it is only moderate, but not infrequently, especially in the cerebral cases, it is quite pronounced. In the latter the patients are often very stuporous, with twitchings, convulsions and respiratory embarrassment. Paralysis of the respiratory center is the usual cause of death in infantile paralysis. Early relief of respiratory embarrassment is therefore important. One lumbar puncture usually suffices, but in some cases it must be done several times till relief is permanent.

The following case history will illustrate:

CASE 1.—A. K., girl, aged 2 years, was admitted to the hospital on the fourth day of an attack of infantile paralysis. Her condition was bad. She was in profound stupor, was cyanosed, and respirations were very irregular, of Biot's type. Macewen's sign of hydrocephalus was marked. There was paralysis of left face and both lower extremities. By lumbar puncture, 60 c.c. of clear fluid under very high pressure were removed; 8 c.c. of normal horse serum were injected. Twelve hours later, the child was much improved but still drowsy, and the respirations were still irregular. Macewen's sign was marked. By lumbar puncture, 50 c.c. of fluid under very high pressure were removed. Two hours later the child was bright, taking the bottle well and breathing well. Convalescence was uninterrupted from that time on.

Relief of hydrocephalus is an important therapeutic measure. In cerebral cases it is often urgently indicated. It is quite safe to remove fluid till the pressure drops to the normal.

2. INTRASPINAL INJECTION OF SERUM, NORMAL HUMAN, NORMAL HORSE OR CONVALESCENT

A highly immune serum for poliomyelitis is what we want. So far such serum has not been produced.

The beneficial results of immune antimeningitis serum therapy have been attributed to a number of factors — the opsonic action of the serum, the stimulation by the serum of a local and general hyperleukocytosis, and the antitoxic, bactericidal and agglutinative action of the serum. Is the hyperleukocytosis, local and general, altogether a specific reaction, produced by the immune serum? I do not believe it is. It is a common experience to inject patients with meningitis, suspected as being meningococcic (of the epidemic type) with immune antimeningococcic serum. Cases which later proved to be poliomyelitis, tuberculous meningitis, toxic meningismus and syphilitic meningitis have been so treated. A cerebrospinal fluid, obtained twenty-four, or sometimes forty-eight hours after such injection of serum, is often turbid, and shows a marked hyperleukocytosis with relative polynucleosis, a reaction frequently observed in true cases of epidemic meningites treated with immune serum. The local hyperleukocytosis is, I believe, to a very great extent a nonspecific protein reaction.

We thus have a simple, almost harmless means of producing a hyperleukocytosis in the cerebrospinal fluid. Normal horse serum and normal human serum can be easily procured, and if sterile and properly injected are harmless.

The objection to horse serum would be the sensitization to foreign protein; heretofore, if available, normal human serum would be preferable.

Epidemic infantile paralysis is not a virulent disease, with a tendency to progress unfavorably. It is the very opposite. The febrile and inflammatory stage is a short one, and the lesions usually appear early in the disease and in most instances do not spread further. The mortality is relatively low, averaging during the height of epidemics from 20 to 30 per cent., but usually much lower. It is a disease against which we have very high natural immunity, as evidenced by the very small percentage of all exposed who actually develop the disease.

It has been found that the production of a general hyperleukocytosis is a most important therapeutic measure, as recently pointed out in the treatment of typhoid fever by the intravenous injection of sensitized vaccine and other nonspecific proteins. Similar observations have recently been noted in the treatment of arthritis by the production of a hyperleukocytosis after nonspecific foreign protein injection. The importance of producing a hyperleukocytosis in the cerebrospinal fluid in the treatment of epidemic meningitis has long been known.

The probable value of a hyperleukocytosis in the cerebrospinal fluid in poliomyelitis, a disease produced by an infectious agent of relatively low virulence, should be considerable. In order to be of most help, the serum would have to be used very early in the disease, during the acute inflammatory stage, if possible in the preparalytic stage, especially if prevention of paralysis and abortion of the disease is hoped for. The active, acute inflammatory stage of the disease is so short that it is often impossible to inject more than one dose of serum in the important early stage. Serum injected intraspinally should be injected under the usual precautions of strict asepsis, and control of the dose by coincident blood pressure observations.

In view of my previous experiences with the injection of horse serum in different central nervous system infections, I felt that the measure should certainly be given a thorough trial in the present epidemic. In 1912, I had occasion to use the treatment in two cases, with results which were encouraging.

The present preliminary report is based on only a small series of cases. In view of the harmless nature of the treatment and the general encouraging results, I felt it important to make this a preliminary report at this time.

A series of ten patients were treated with normal horse serum. Unfortunately most of the cases admitted to the hospital were late cases, but a few of the early cases showed interesting results.

The following case histories show the results in different stages and types of the disease:

Case 2.—G. A., boy, aged 3 years, ill forty-eight hours, was admitted in the early stage with general meningitic symptoms, high fever, 105 F., and a slight facial paresis. Sixty c.c. of cerebrospinal fluid under high pressure were removed by lumbar puncture. Fifteen c.c. of normal horse serum were injected.

Examination of the cerebrospinal fluid gave typical findings. Eighteen hours later the temperature was normal, and the patient much improved in every way but still drowsy. Forty-eight hours later he was still drowsy, and slept most of the time. Macewen's sign was marked. Temperature was 101, and rigidity of the neck was again distinct. By lumbar puncture 30 c.c. of cerebrospinal fluid were removed, and 10 c.c. of horse serum injected. Eighteen hours later the condition was about the same.. Thirty-six hours later there was decided improvement. Forty-eight hours later the boy was convalescent, seven days after the acute onset. No paralysis developed.

Case 3.—Child, aged 3 years (Bridgeport hospital), ill forty-eight hours, was in the acute meningitic stage, with no definite paralysis, but pronounced symptoms of acute meningeal irritation.

Diagnostic puncture of cerebrospinal fluid under high pressure gave typical findings. Two hours later about 15 c.c. of cerebrospinal fluid were removed by lumbar puncture, and 15 c.c. of horse serum injected. Twenty-four hours later the temperature was down and the child much better. Forty-eight hours later the child was convalescent, with no paralysis, and recovery was uninterrupted.

A number of patients under treatment with late cases appeared to show much more improvement than is seen in cases clearing up without any treatment. It should be noted, however, that some cases, even with considerable paralysis of limbs, face or throat, clear up within a period of a few days without treatment of any kind. Judgment of results under curative treatment must therefore be based on comparative results. Results from curative treatment in the late cases could be expected only where there was no destruction of tissue.

Case 4.—Girl, aged 9 years, ill one week, was still very irritable, and evidence of acute meningitic irritation was still present. There were marked anteroposterior spasm of the neck, and spasm and tenderness of the back. Macewen's sign was marked. Diplegia was complete. Sixty c.c. of clear fluid under high pressure were removed by lumbar puncture, and 15 c.c. of normal horse serum injected.

Twenty-four hours later the patient felt better and was less irritable. Rigidity of the neck and back had improved. She could move with greater ease.

Forty-eight hours: The patient felt good, and could sit up. Opisthotonos was gone.

Seventy-two hours: Rapid improvement continued; some power had returned to both limbs. The patient sat up and moved with freedom.

Five days later the child was convalescent. Diplegia was present, but some power had returned to the limbs, which were growing stronger. There will probably be partial permanent diplegia.

Case 5.—Child, aged 4 years, with disease of twelve days' duration, had paralysis. There were diplegia and paralysis of the right upper extremity. Evidence of acute meningeal irritation was still present; the patient was very irritable; anteroposterior spasm of the neck and Kernig's sign were marked; respiration showed occasional intermittence. The general condition was only fair. Forty c.c. of clear fluid under high pressure were removed by lumbar puncture, and 12 c.c. of serum injected.

Eighteen hours later, the child was much brighter, and less irritable. Rigidity of the neck was almost gone. The general condition was better.

Two days later, improvement continued; power was beginning to return to the paralyzed limb.

Four days later, the improvement continued steadily; considerable power had returned to the paralyzed limb.

The immediately favorable response in this case might, to a very great extent, be attributed to the relief of hydrocephalus, but the coincident improvement in the paralyzed limbs suggests favorable action of the serum.

Case 6.—Child, aged 1 year, was admitted to the hospital on about the fourth day of illness, with right hemiplegia, repeated general convulsions, and continuous clonic convulsion of the paralyzed side. The general condition was bad. Respiration was irregular, of Biot's type. The child was very irritable and stuporous. The fontanel was markedly bulging.

Thirty c.c. of fluid under high pressure were removed by lumbar puncture, and 12 c.c. of serum injected.

Eighteen hours later there was no improvement.

Daily puncture for three successive days was done with injection of horse serum varying from 3 to 12 c.c. There was continuous but slow improvement, and after the fourth treatment the paralysis totally disappeared, the child became bright, took its nourishment well, and made an uninterrupted recovery.

EFFECT OF SERUM INJECTION ON CEREBROSPINAL FLUID

As previously explained, in almost all instances there is a hyperleukocytosis with relative polynucleosis, a change in condition from a moderate number of lymphocytes, within eighteen hours to a very high cell count, almost all being polymorphonuclears. The fluid macroscopically twenty-four hours after serum injection often shows a faint opalescence; occasionally the fluid becomes very turbid, but bacteriologic examination shows a sterile fluid, like that seen in aseptic meningitis. The fluid of the last case treated shows findings typical of all: original fluid on first puncture: clear fluid, moderate pressure, seventy cells per cubic millimeter, all lymphocytes. Globulin positive plus. Fluid eighteen hours after serum injection: 330 cells per cubic millimeter, almost all polymorphonuclears; globulin + +.

The cytologic change following serum injection disappears in a varying length of time, usually about forty-eight hours.

Convalescent Serum.—The use of a blood serum obtained from cases convalescent from infantile paralysis offers the advantage of a human serum plus the presence of immune bodies. That serum obtained from at least recently convalescent cases contains immune bodies has been proved by the neutralization test in the monkey (the neutralization of poliomyelitis virus mixed with the serum, and subsequently injected into the monkey). It has been stated that serum is potent even from those who had had infantile paralysis years previously. The serum used in our series was obtained from two adults three weeks' convalescent. About 10 ounces of blood were removed through a large needle into sterile bottles under strict asepsis. The blood was immediately shaken thoroughly (glass beads in the sterile flasks helps the defibrination). The blood was then thoroughly centrifugated, and the serum aseptically siphoned off. If the serum is to be stored for later use, it is desirable to add a little preservative, as chloroform, and to heat at 56 C. (132.8 F.)

for one hour. The serum should be tested for the Wassermann reaction.

Netter[1] reported the use of convalescent serum in thirty-two cases, with good results. The difficulties of arriving at any decision as to the value of convalescent serum are apparent in attempting an analysis of his figures.

Our first series here reported consist of four cases:

CASE 7.—E. R., aged 4½ years, ill two days, was admitted to the hospital in the preparalytic, meningitic stage. The temperature was 102; there was no paralysis. Forty c.c. of clear fluid under high pressure were removed by lumbar puncture, and 15 c.c. of convalescent serum injected.

Eighteen hours later the child was brighter, not so irritable or drowsy, and there was no paralysis.

Steady improvement continued till the third day, when slight paralysis of the right deltoid appeared.

Sixth day, the patient was well, and there was no paralysis.

This case could well be considered aborted.

CASE 8.—M. C., girl, aged 8 years, ill five days, had complete paralysis of both lower extremities, and partial paralysis of both upper extremities. The patient was very irritable, restless, and noisy, and had considerable respiratory embarrasment. During the first two days in the hospital, general treatment was used, but the condition was unchanged and caused us considerable anxiety on account of the respiratory symptoms. Convalescent serum was then used.

Thirty-five c.c. of clear fluid were removed by lumbar puncture, and 15 c.c. of convalescent serum injected.

The patient on the following day was quieter, looked better and felt better. Her limbs were less painful and tender. Improvement in her general condition continued, but up to the time of this report, six days later, there was no change in the paralytic condition.

CASE 9.—J. A., aged 4 years, was treated on the twelfth day of illness. The general condition was good, but there was phrenic paralysis and persistent cyanosis. Little was to be expected from serum treatment, but it was administered on account of the gravity of the condition. Sixty c.c. of cerebrospinal fluid were removed, and 13 c.c. of convalescent serum injected. Ten days later, there was slight improvement, but it was apparently not due to the serum.

CASE 10.—Child, aged 1½ years, admitted about the sixth day of the disease, with diplegia, was very drowsy, and had marked respiratory irregularity. Macewen's sign was marked.

Forty c.c. of clear fluid were removed by lumbar puncture, and 10 c.c. of convalescent serum injected.

Twenty-four hours later the general condition was much improved, and the child was brighter.

Four days later the child was convalescing, but there were no changes in the paralytic condition.

Results.—The convalescent series was very small, but the results were certainly no better than in the normal horse serum series.

In the normal horse serum series, two cases treated in the preparalytic stage were aborted. One case was aborted under the convalescent serum treatment. Best results were obtained in early cases.

Some of the late cases treated showed more improvement than is generally seen in untreated cases. There was more rapid convalescence and improvement in the paralytic condition.

It is hard to judge as to the saving of life, but the sickest patients, totaling fourteen, were selected for treatment, and there was only one death; that patient was almost moribund at the time of treatment.

Normal Human Serum Treatment.—No observations were made.

1. Netter: Arch. de méd. d. enfants, Jan. 16, 1916.

Epinephrin Treatment.—Dr. S. J. Meltzer suggested the use of epinephrin intraspinally as an active form of treatment.

The work of Dr. Clark,[2] done at Dr. Meltzer's suggestion, on the action of subdural injections of epinephrin in experimental poliomyelitis, indicated that for a time at least there was considerable response in the paralyzed animals.

Observations in the hospital were made in only three cases, an insufficient number from which to make any deductions. A boy of 5 with respiration paralysis had three doses at six-hour intervals. There was considerable temporary improvement, but the boy ultimately died. The other two patients each had only one dose with no result except sharp rise in blood pressure. Dr. Meltzer's suggestion, however, was to inject the epinephrin intraspinally at least every six hours in doses of from 0.5 to 1 c.c. for small children.

3. TREATMENT OF RESPIRATORY PARALYSIS

Respiratory paralysis is the most common cause of death in infantile paralysis. It is therefore of prime importance to meet this complication early, so as to tide the patient over the critical period until congestion and inflammation about the center subside. Transient paralysis, which can most logically be explained as being due to relief of congestion, edema and vascular involvement, is one of the regular features of this disease.

Many have noted that patients could be kept alive for hours, in one case three days, under artificial respiration.

In very stuperous, comatose cases with respiratory paralysis, a more active form of artificial respiration is indicated. At my inquiry, Dr. Meltzer suggested his pharyngeal respiratory apparatus for comatose patients; and for conscious patients, if possible early after respiratory difficulty has set in, he suggested the administration of oxygen under pressure by his method. A more detailed discussion of the results and technic will be given in a later paper. The administration of oxygen under pressure kept a number of patients alive for hours. It was used in several cases with slight respiratory embarrassment with benefit, but it was difficult to judge in these whether more serious respiratory paralysis was warded off.

The pharyngeal apparatus was used in several cases without result. As a rule the patient is conscious almost until the end, so that pulmonary edema is far advanced when the patients become unconscious. The method, however, should certainly be given careful trial.

4. GENERAL TREATMENT

At this time attention will be directed only to the importance of general treatment, especially in public wards. We are dealing with helpless children, each of whom requires especial care as to feeding, and care of bladder and bowels. Respiratory embarrassment should be carefully watched for. Turning from side to side is important; in this connection Dr. Meltzer suggested that it might possibly have some influence on the paralysis, owing to shifting of edema.

5. ORTHOPEDIC TREATMENT

This should be begun as early as possible. Patients should be watched from the beginning by the orthopedist.

2. Clark, P. F.: The Action of Subdural Injections of Epinephrin in Experimental Poliomyelitis, THE JOURNAL A. M. A., Aug. 3, 1912, p. 367.

FOCAL INFECTION IN RELATION TO CERTAIN DERMATOSES*

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It is an unfortunate fact that we dermatologists have neglected the search for the true etiologic factors of the diseases of the skin, devoting our efforts more to nomenclature and classification. Recently there has been a change, and research into dermatologic diseases is being undertaken more vigorously now, both in laboratories devoted especially to dermatologic pathology and bacteriology and in the clinics and offices of the dermatologists themselves. Especial credit for this awakening is due to Billings and Rosenow, whose theory of focal infection has opened our eyes to the explanation of certain dermatoses whose etiology was entirely obscure a few years ago. Now that we have the key we can unravel many a mystery, trace relationships, and diagnose intelligently, whereas only a few years ago we had to fall back on the much overworked term "idiopathic" in the description of such cases. It is a very few years since the epochal work of Billings described the relationship between focal infection and systemic disturbances; the theory at first met with ridicule and unbelief, but was so well supported by clinical and experimental data that it soon gained practically universal acceptance, and a vast amount of work has been done in the new field opened up by it. Of course, as is usually the case with that which is new, some men became too enthusiastic about it and carried it to an extreme, sacrificing teeth and tonsils, whether abnormal or not, in the presence of almost any diseased condition of the body, without stopping to make a careful search for the true causes. However, more conservative observers have been utilizing the new theory to great advantage, and while they have not found it an explanation of all diseases, they have opened up a new chapter in the study of the etiology of many diseases and the consequent rational treatment of them.

There are few to doubt that the presence of a steady spring of infection can cause many reactions and inflammations in other parts of the body in which the bacteria may find lowered resistance or a more suitable soil. Especially has this been recognized in those cases of arthritis and neuritis which were formerly lumped together as rheumatism, because so many of these cases have been reported; but not less true is it that a similar relationship exists between the so-called "focal infections" and skin diseases; and a great many dermatoses, formerly attributed to various other causes, can now be definitely traced to focal infections. Focal infection does not mean, as some seem to think, a source of infection in mouth or throat only, for the infecting source may be almost anywhere in the body. Most of us have encountered cases which could be traced to infection of the kidney, bladder, prostate, urethra or other part of the genito-urinary tract, or to infection from gastric or duodenal ulcer, chronically inflamed appendix, rectal fistula, or cholecystitis. Middle ear disease is a frequent cause of skin reactions, infected sinuses another; typhoid fever is also liable to cause dermatoses, as nearly all the more chronic infections may do, as well as sometimes the acute ones, such as pneumonia.

The reader of dermatologic literature will occasionally find mention of the part played by focal infections in skin diseases. Gosse[1] quotes McKenzie, 1886, that erythema nodosum is often accompanied by rheumatism, and suggests that it may be due to toxic or infectious diseases, in which connection it is interesting that Edward C. Rosenow,[2] working at the Mayo Clinic, reported recently that certain streptococci have an elective affinity for the skin, most evident in strains isolated from cases of erythema nodosum and herpes zoster, but also manifested to a lesser degree by strains from endocarditis, myositis, mumps and cholecystitis.

Galloway's article[3] in 1912 should not be overlooked in this regard. He lays stress on the fact that in rheumatic infections we often see a scarlatiniform eruption, exudative multiform erythemas, and erythema nodosum, and especially that such erythemas accompany septic forms of rheumatism. In streptococcal infections of the kidney, liver and joints an inflammatory erythema of the skin frequently appears. At times a pure hemorrhagic eruption occurs (purpura rheumatica, peliosis rheumatica Schoenleinii).

Gerber's investigations[4] are worthy of note, owing to their thorough and scientific character. He worked out the relationship of focal infection to certain of the idiopathic dermatoses. From the clinical point of view, Born, Uffelmann, Lewin and Besnier have noticed the coincident appearance of sepsis and erythema. Hoffman succeeded in detecting cocci in the altered veins in a case of erythema nodosum, while Gerber investigated ten cases of this disease and found all of them due to focal infection, the genito-urinary organs being the source of infection in one case, an abscess in still another. Histologic examination of the nodes revealed a thrombophlebitis of the cutaneous veins; in three cases cocci were found by this examination, while in still another case a growth of cocci was secured when cultures were made of parts of the nodes.

Audrych,[5] in 1914, reported two cases of herpes zoster which were due to furunculosis, both of the patients recovering as soon as the furuncles ceased to make their appearance.

In septicemia, Churchman[6] observed the following changes: erythemas, papular eruptions, urticarial eruptions, hemorrhagic eruptions, bullous eruptions and herpetic eruptions.

Vershinin[7] believed that a great many dermatoses might be due to gonorrheal infection, such as erythema exudativum, keratosis and parakeratosis. In my experience, cases of recurrent eczema were due to gastric and duodenal ulcers. A recurrent urticaria was associated with carcinoma of the pancreas and a case of generalized pruritus with malignant tumor of the uterus.

Many more cases of this kind could be quoted. It is deplorable that dermatologists have not been plodding enough to collect such cases in the past, but it is a good sign that there is more work being done along these lines at present.

* Read before the Section on Dermatology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Gosse: Erythema Nodosum, Practitioner, London, 1914, No. 2.
2. Rosenow, E. C.: Elective Localization of Streptococci, THE JOURNAL A. M. A., Nov. 13, 1915, p. 1687.
3. Galloway, J.: Cutaneous Affections in Rheumatic Conditions, Practitioner, London, 1912, lxxxviii, 67.
4. Gerber, O.: Ueber das Wesen den so-gennanten idiopathischen Erythem, Dermat. Ztschr., 1912, No. 9.
5. Audrych: Zona conjugal, Ann. de dermat. et de syph., 1914, No. 5.
6. Churchman: Urol. and Cutan. Rev., 1914, No. 1.
7. Vershinin: Dermatoses Due to Gonorrheal Infection, Russk. Jur. kozhn. i ven. bolezn., 1914, No. 5.

The following cases have been collected for this paper owing to the fact that they were obscure as to etiology and resistant to treatment, and may therefore be of some interest to the general practitioner. In all of them the usual remedies recommended by the best authorities were tried, but with only slight or transient relief.

REPORTS OF CASES

CASE 1.—M. R., man, aged 23, with no history of syphilitic infection, had on his left cheek a tumor which looked very much like an epithelioma. Several surgeons examined him when I exhibited him before the Jefferson County Medical Society, and they agreed that it was malignant. Portions of the ulcer were removed and sent to two laboratories for examination. The reports from the two laboratories were essentially the same: proliferation of the epithelial layers and their invasion of the deeper structures. The destruction of tissue was too rapid, however, for me to be satisfied that true malignancy was present. Further and more thorough examination revealed an infected root canal and alveolar abscess of an upper molar. On extraction of this tooth a fistulous tract was revealed. Simple treatment of irrigations with mild antiseptics sufficed to heal the fistula, after which the ulcer healed rapidly, leaving only a small scar.

CASE 2.—B. O., woman, aged 23, garment operator, referred to me by Dr. Boggess, had a typical roseola eruption, sore throat, swollen glands and patches in the mouth; fever of from 102 to 103, and headaches. Syphilis was suspected. The patient denied any illicit intercourse, but was afraid that she might have syphilis insontium. The Wassermann reaction was negative. On closer examination I found ragged tonsils with crypts full of pus. The *Bacillus influenzæ*, pneumococci and streptococci were found. Applications to the tonsils locally, with acetylsalicylic acid (aspirin) and hexamethylenamin internally, cleared up the symptoms. The patient was advised to have her tonsils removed, but she refused and has had several attacks since then.

CASE 3.—N., woman, aged 24, referred to me by Dr. A. Pfingst, had chronic attacks of urticaria of angioneurotic type. All the usual remedies failed to relieve her. After eliminating all other possible causes that might have been responsible for her condition, hypertrophied tonsils with infected crypts were found. After the removal of the tonsils by Dr. Pfingst, urticarial attacks became milder and eventually entirely disappeared.

CASE 4.—M. W. D., girl, aged 17 years, had acne which yielded to Roentgen therapy and mild lotions. A year afterward she developed a very obstinate case of urticaria which made her life miserable. No treatment of any kind was of any avail. The affection persisted for months. (During my vacation she consulted and received attention from other physicians without any benefit.) Noticing the peculiar way she swallowed her words when talking, I examined her throat and found abnormal tonsils. The latter were removed and improvement followed rapidly. No further attacks have been reported.

CASE 5.—Miss E. W., aged 18, had a very obstinate attack of urticaria, accompanied by angioneurotic edema. The usual remedies were employed externally and internally with little benefit. Examination of her throat revealed very badly hypertrophied tonsils. After the removal of the tonsils the dermatosis disappeared.

CASE 6.—Mrs. F. S., aged 21, referred to me by Dr. Ewing Marshall, was treated for a very obstinate case of urticaria, accompanied by angioneurotic edema. Ordinary remedies caused only slight improvement, and that mainly in the subjective symptoms. Recurrent attacks persisted. She was advised to consult Dr. Cheatham, who found hypertrophied pyogenic tonsils. Their removal was followed by a prompt disappearance of all the symptoms.

CASE 7.—H. B., girl, aged 11, was suffering from frequent attacks of scarlatiniform erythema accompanied by high fever. Ordinary remedies gave prompt relief, but since the attack recurred quite often and local throat remedies only temporarily relieved her condition, removal of the tonsils was advised. After their removal she made a perfect recovery.

CASE 8.—Mrs. J. B., aged 60, suffered from recurrent attacks of labial and generalized eczema. Pruritus accompanying these attacks was unbearable. Repeated urinalysis showed no cause for them. A vesicovaginal fistula was discovered, and she was referred to the late Dr. W. Wathen. After this trouble had been corrected the attacks ceased entirely.

CASE 9.—Mrs. R., aged 34, consulted me for chronic recurrent eczema of the head and chest. We attributed the cause of her illness to faulty metabolism. Internal and external remedies only temporarily relieved the condition. Mild attacks suggesting a chronic appendicitis occurred several times. An operation was suggested by me. After the removal of the appendix by Dr. Haggard of Nashville, the skin reactions ceased to make their appearance.

CASE 10.—Miss N. C., aged 26, referred to me by Dr. Duvall of Ghent, Ky., developed a very severe case of erythema circinatum bullosum. The etiology was traced to streptococcic infection of the throat. When the throat received the proper attention, the erythema yielded to mild external applications.

COMMENT

These are only a few selected cases. Many more could have been cited. Not all systemic and skin derangements are due to focal infection; a great many obscure diseases may be traced to faulty internal secretions, which offer a great field for clearing up the etiology of obscure diseases; but, again, faulty internal secretions may be due to focal infection. It all teaches us to be on our guard and to make thorough examinations in doubtful cases. Let us be more careful, cautious, conservative and painstaking, and, above all, let us treat the skin not as a surface only, but as a cutaneous organ, as capable of infection from within as any other organ.

ABSTRACT OF DISCUSSION

DR. EVERETT S. LAIN, Oklahoma City: I am inclined to believe that focal infections may be as important a factor in the causation of some of the common skin eruptions as are food or protein anaphylaxis. Last year, in discussing lichen planus, I mentioned that I had been roentgenographing the teeth and examining the tonsils in all of my cases of lichen planus. In the publication of that discussion, in spite of the fact that I had corrected the proofs, the typesetter made me say that I had been treating these cases with the Roentgen ray. At any rate, I am making a search for apical abscesses and pyorrhea. My investigations along this line are not yet complete, for I wish to collect a sufficient number of cases to make the conclusions drawn therefrom worthy of consideration. However, I can say now that in a large percentage, perhaps 95 per cent., of cases of herpes zoster, we have found apical abscesses. In a large percentage of cases of lichen planus, about 85 per cent., we have also found similar pockets of pus or evidences of pyorrhea. In the majority of cases of herpes zoster the symptoms began to subside within a short period after the extraction of the infected teeth. We have known for a long time that tonsillar infections were closely allied to rheumatism and herpes zoster. Something more definite, perhaps, may develop from this work.

DR. RICHARD L. SUTTON, Kansas City, Mo.: I am convinced that in some instances certain skin disorders, as herpes zoster and erythema multiforme, are a result of the absorption of specific micro-organisms from foci in the tonsils or in root abscesses. Dr. Lain recently called my attention to the frequency with which alveolar abscesses are found in these cases, and I believe that in every instance a roentgenogram should be made of the patient's maxillae. Such a procedure requires only a few moments, is inexpensive, and may serve to throw much light on the point in question.

DR. WALTER J. HEIMANN, New York: Herpes zoster is an acute infectious disease producing immunity. Thus recurrences are practically never seen. If it were the result

of a persistent focus of infection in the gums, or at root apexes, it would be reasonable to expect repeated attacks, which is contrary to our experience.

Dr. Ernest L. McEwen, Chicago: One of the cases of herpes zoster reported by Rosenow occurred in the dermatologic clinic at Rush Medical College. The man had a severe attack of herpes zoster involving the right side. On examination, the tonsils were found to contain pockets of pus, and from this pus an organism was grown which was inoculated into dogs in whom, I believe, the disease was reproduced and the organism again recovered.

Dr. Howard Morrow, San Francisco: During the past year we have seen a number of cases with localized areas of inflammation on the tongue, and indistinguishable from syphilitic glossitis. The patients were given antisyphilitic treatment without avail. On further examination, alveolar abscesses were found, and after the removal of the involved teeth the glossitis disappeared.

Dr. Michael Leo Ravitch, Louisville: Dr. Lain said that in over 80 per cent. of cases of lichen planus investigators found evidences of a source of focal infection. That has not been my experience, and my few cases could not be traced to focal infection, no matter how hard we tried. I do not think that lichen planus can be traced to a focal infection, nor do I believe that many cases of dermatoses are due to infection from the mouth or nose. There are many other possible sources of infection in the body.

THE DIET OF CHILDREN AFTER INFANCY *

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During the last quarter of a century more careful study has been given to infant feeding than to any other subject in pediatrics. Nearly every clinician has his favorite method, which he is willing, even anxious, to defend on all occasions. The infant, too, has been made the subject of a considerable number of complete metabolism experiments, in which his total heat loss has been calculated and the amount and composition of the food necessary to supply this loss and to furnish material for the rapid growth of his body have been estimated. These determinations of the data necessary for the infant's life and growth have confirmed the clinical experience of many years, namely, that while there are often marked individual differences in their need for food, sufficient nourishment can be supplied in an almost infinite number of food combinations, and that infants have a remarkable and very fortunate capacity to assimilate mixtures which are far removed in composition from their normal diet. While all this is true, it has been shown frequently that few babies can be made to gain who do not receive nourishment having a calorific value of more than 70 calories per kilogram, that is, 32 calories per pound; that the average infant will thrive best on a diet approximately 100 calories per kilogram, 45 calories per pound, and that a certain number of infants require considerably more than this last amount in order to thrive.

This knowledge of the infant's dietetic needs and even an approximate adjustment of his food to him under various conditions of temperature and environment, together with a much greater attention to the cleanliness of his milk mixtures, have been potent factors in the reduction of infant mortality among bottle fed babies in recent years. When one considers these facts, which are generally recognized in respect to the infant, it is somewhat remarkable that comparatively little attention has been given to the diet of children who have recently passed their infancy. It is true, of course, that the diet of older children becomes increasingly complex and diversified, as they advance in age, and also true that the need for a specially restricted diet is less imperative for runabouts than for infants.

It does seem advisable, however, that when one is attempting to feed young and growing children, a diet should be provided in which the number of heat units in proportion to the weight of the child should be known, as well as the ratio of the protein content to that of the fat and carbohydrates. A young child's diet need not be radically altered from day to day. By a suitable interchange of cereal and fresh vegetables, meats and simple desserts, having about the same food values, sufficient variety is afforded. There have been no careful recent studies on the metabolism of growing children. Writers today still rely on the painstaking researches of Camerer[1] on his own children, conducted more than twenty years ago, for their fundamental data.

TABLE 1.—FOOD REQUIREMENT FOR CHILDREN PER KILOGRAM OF BODY WEIGHT

Age, Years	Sex	Protein, Gm.	Fat, Gm.	Carbohydrate, Gm.	Calories
2 to 4.....	Each	3.6	3.1	9.2	75
5 to 7.....	Girls	3	1.9	10.7	69
	Boys	3.5	2.5	10.9	76.6
7 to 10.....	Girls	2.7	1.3	9.9	39.2
	Boys	2.8	1.3	10.4	61.6

Camerer estimated the food needed for children of various age periods per kilogram of body weight to be about as shown in Table 1. Similar investigations on young children made by Hassa, Herbst, Steffin and Uffelman have been tabulated by Locke.[2] These tables bring out several important facts, which must be borne in mind the successful feeding of children.

First, the actual amount of food required by growing children increases gradually to maturity.

Second, the relative quantity of food in proportion to the body weight decreases almost as regularly from infancy to maturity; that is to say, the amount of food and the number of heat units per kilogram or pound is greater the younger the child. The calorific value of the food required per unit of body weight at various ages can be estimated only roughly. Locke combines the values determined by several authors as shown in Table 2. This he thinks may be a safe general standard. It is freely granted that many children will thrive on a diet of lower calorific value and occasionally one will need more food to insure gain. It is of distinct help, however, to bear in mind the average dietary needs, so that a wide departure from this mean

TABLE 2.—FOOD REQUIREMENT DETERMINED BY SEVERAL AUTHORS, COMBINED BY LOCKE

Age, Years	Calories per Kg.	Calories per Lb.
2.....	94	42
4.....	82	37
8.....	67	30

* Read before the Section on Diseases of Children at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Camerer: Der Stoffwechsel des Kinder, Tübingen, 1894.
2. Locke: Boston Med. and Surg. Jour., 1912, clxix, 702.

will be made only for definite indications. The lack of sign posts of this kind in the textbooks on pediatrics is too evident. In some, certain amounts of various foods are prescribed for children of given ages under two years, while in many of them no idea of the proper amount of cereal, meat or green vegetable suggested is intimated.

A case which illustrates the injury from unwitting overfeeding is the following:

A girl of 5 years was brought to the office from a neighboring city because she would not gain. She had a long febrile illness with chronic otitis media two years before and remained in a hospital for two months. She was discharged in fair condition and continued well for some months, when she went through a severe attack of ileocolitis. Following this she gained slowly. The mother became anxious. She had a carefully arranged diet list and the food was prepared with the greatest care by a trained attendant. Because of her failure to gain, the amount of food was steadily increased despite the occurrence of occasional attacks of acute indigestion. The stools were unusually large.

When seen, the child had not gained for several months, was pale, her eyes were slightly sunken and she was much under weight. The diet was investigated and found to be well balanced, but to yield about 2,500 calories or more than 150 calories per kilogram. When this was reduced by about one half the patient became much more sprightly and vigorous and began to make slow gain. The amount of fecal material was greatly reduced.

This case, I believe, is not exceptional and illustrates a danger which could be readily avoided if the calorific limits of the child's dietary requirements, above and below which it was not advisable to go, had been ever so roughly determined, as would have been done had she been an infant.

In regard to the proportion of proteins, fats and carbohydrates needed in a child's diet in relation to age and weight, it is impossible to speak very definitely. Protein is essential to repair waste, but when sufficient fats and carbohydrates are present to supply heat and energy the amount of protein needed is comparatively small.

From the investigation already referred to it is recommended that not more than 4 gm. of protein per kilogram be given in early childhood and about one half of that amount after 8 years. Usually about 50 per cent. of the protein of a child's diet should be of animal origin; in later life an increasing proportion is furnished from the vegetable kingdom. As is well known, the fats and the carbohydrates are to a certain extent interchangeable in an average diet. The fats have double the heat-producing power of either proteins or carbohydrates and can be increased when there is need of raising the caloric value of a diet without adding to its bulk.

In Camerer's cases, the child at 2 years was given 4 gm. of fat per kilogram and but 2 grams at 10 years. A similar gradual reduction has been recommended by other investigators, and confirmed by long clinical experience.

The carbohydrates are likewise subject to marked variations in a child's diet. There is a great increase in the total amount of carbohydrate ingested as the child grows older, and there is a slight reduction in the carbohydrate intake per unit of body weight. Too little carbohydrate leads to acidosis. Locke puts the minimum requirement in childhood as 50 to 80 gm. per day. The usual quantity given is considerably more, perhaps 150 gm. or 10 gm. per kilogram of body weight.

Taking the average values from a large number of investigations, Summerfield[3] has tabulated the variations of proteins, fats and carbohydrates, at several age periods as shown in Table 3. If one calculates the caloric values of the diet thus summarized, they can be shown not to vary greatly. The marked difference in the figures are readily explained, as the fat and carbohydrates are largely interchangeable, and this is true in a measure of the protein also. In other words, the food requirements of the body can be met by a great variety of combinations and the physician has a large latitude in his effort to adapt the child's diet to its digestive capacity and at the same time provide for the necessary heat, energy and growth.

The quantity of water, fluid, given a young child varies within large limits with its exercise, the temperature, the moisture of the atmospheric air, and the character of the food. A liter or quart should be the minimum fluid intake at 2 years, according to Camerer, and this amount is increased to about three pints for a child of 7 years.

The metabolism of the mineral salts has been much studied recently. Salts are essential to the well-being of the growing child, but are furnished in abundance in a diet containing the average quantities of cereals, green vegetables, milk and fruits. A small amount of table salt should be added to cereals and vegetables to make them more palatable. In a well-assorted diet in health they need not be calculated. With these fundamental needs of the child in mind, the physician should add to the exclusive milk diet of early infancy in such a manner as to provide a balanced ration and one readily digested.

TABLE 3.—FOOD REQUIREMENT AVERAGED FROM MANY INVESTIGATORS, TABULATED BY SUMMERFIELD

Age, Years	Protein, Gm.	Fat, Gm.	Carbohydrates, Gm.
From 2 to 4.....	40 to 64	32 to 62	110 to 205
From 5 to 7.....	50 to 58	30 to 62	145 to 197
From 8 to 10.....	60 to 88	30 to 70	220 to 250

The first addition other than sugar is some form of cereal. Cereal gruels, when properly prepared, can be digested in early infancy. A cereal water may be used as a diluent instead of water. After the age of 6 months cereal gruel should be given the baby once or twice a day. At 10 or 12 months broth or beef juice can be given in increasing quantities up to 2 or 3 ounces. It is often well to add to the broth well-cooked rice, stale bread or plain cracker. If there is a tendency to constipation, the pulp of baked apple, apple sauce or prune pulp, one to three tablespoonfuls, can be given to a child about 1 year of age. From this time onward to the second year the diet can gradually be extended by the addition of an occasional coddled egg and later of some scraped lean beef. Baked potato or macaroni can be substituted for rice. Dry toast, stale bread or cracker with a small quantity of butter are helpful during teething.

At from 10 to 18 months one of a number of green vegetables, thoroughly cooked and strained, may be given in small quantities, one or two tablespoonfuls, with the midday meal. At this time a simple dessert, junket, custard, tapioca, etc., can be added. By these

3. Summerfield, in Pfaundler and Schlossmann: The Diseases of Children, Am. Edit., Philadelphia, J. B. Lippincott Co., i, 424.

simple procedures the child's diet is gradually amplified, in accordance with the underlying principles already referred to. Perhaps the most frequent mistake that is made in feeding babies between 1 and 2 years of age is the tendency to continue with large quantities of milk, at the expense of a more varied diet. Milk contains little or no iron, and by this time the child has used up that surplus stored in his organs and unless more is furnished it becomes pale and ceases to thrive. Another frequent difficulty results from the too frequent feeding of children after their first year. Five feedings, including milk, often reduced to four in twenty-four hours, if properly spaced, will give the child all the food he needs and this will be taken with much more zest than if the feedings are more frequent. As has already been emphasized, one realizes fully that children can be made to thrive on widely differing diets and certainly one would hesitate even to suggest that any particular diet list is to be preferred.

It has seemed helpful, however, to have at hand a diet list for several age periods, in which the caloric values and the protein, fat and carbohydrate contents

TABLE 4.—DIET LIST SUITABLE FOR CHILD OF 12 TO 18 MONTHS

Hour	Food	Amount		Protein, Gm.	Fat, Gm.	Carbohydrate, Gm.	Calories, Gm.
		Ounces	Grams				
6:30	Cereal, strained	2 to 3	90	1.5	0.2	10.0	50
	Milk	8	250	8.0	9.0	11.0	165
							215
10:30	Milk	8	250	8.0	9.0	11.0	165
	Zwieback, 1 piece	..	...	1.4	1.4	11.0	65
							230
1:30	Broth, chicken	3	90	2.5	...	....	10
	Rice or macaroni	2	50	1.4	...	12.0	60
	Bread, small slice	..	...	2.5	0.5	15.0	75
	Milk	4	125	4.0	4.5	5.5	83
							228
5:30	Cereal	2 to 3	60	1.5	0.2	10.0	50
	Milk	8	250	8.0	9.0	11.0	165
	Apple sauce, 1½ table spoonfuls	..	40	...	0.25	16.0	70
							285
	Approximate total	..	..	38.8	35.05	112.5	908

are determined. With a sheet of this kind before us, we can easily substitute similar foods for those on the list and still keep well within the limit of a child's tolerance. A simple list suitable for a child of 12 to 18 months, weighing 24 pounds, 11 kilograms, is given in Table 4.

This list affords about 90 calories per kilogram of body weight, or 41 to the pound. About 30 gm. of the protein is derived from animal food and 8 gm. from vegetable food. This provides about 1,000 calories. In it, too, the total quantities of protein, fat and carbohydrate are all well within the limits thought to be desirable. It is noted that a small portion of the total protein is furnished from the vegetable kingdom. A diet list for an older child, say between 2 and 4 years of age, weighing 13 kilograms, approximately 30 pounds, could be as given in Table 5.

This list provides about 80 calories per kilogram of body weight, or 38 per pound, and supplies 26 gm. of animal protein and 19 gm. of vegetable origin. It is to be noted that the calorific value of the diet is about the same as that suggested for a younger child, that there is considerably more variety, that the proportion of milk is reduced and that but three feedings are given in twenty-four hours. There is a slight advance in the amounts of all the food elements, which are still well within the average limits. It is to be noted also that a larger proportion of the protein is derived from the vegetable kingdom.

It is believed that with information of this kind before him, the physician may find it easier to sub-

TABLE 5.—DIET LIST SUITABLE FOR CHILD OF FROM 2 TO 4 YEARS OF AGE

Hour	Food	Amount		Protein, Gm.	Fat, Gm.	Carbohydrate, Gm.	Calories, Gm.
		Ounces	Grams				
Breakfast	Cereal	3	100	2.8	0.5	11.5	60
	Egg, boiled	1.4	50	6.6	6.0	....	80
	Bread, 1 slice	1	30	4.0	0.5	20.0	100
	Butter	½	8	...	7.0	....	60
	Milk	6	180	6.0	7.0	8.0	120
							420
Dinner	Meat	1	30	7.0	3.0	....	60
	Potato	2	60	2.0	...	16.0	75
	Green veg. (spinach)	2	60	1.5	2.5	2.0	35
	Bread, 1 slice	1	30	3.5	0.6	20.0	100
	Butter	½	8	...	7.0	....	60
	Dessert (custard)	1	30	2.0	3.0	6.0	60
							390
Supper	Cereal	3	100	2.8	0.5	11.5	60
	Milk	6	180	6.0	7.0	8.0	120
	Crackers	..	30	0.4	0.4	3.0	20
	Fruit (apple, baked)	2	60	...	...	15.0	60
							260
	Approximate total	..	...	45	45	121	1,070

stitute similar foods for those specified in the table and at the same time give an equally satisfactory diet. In the preparation of food so much is of necessity inaccurate that it is entirely useless to attempt to do more than give approximate values for the quantities of food used. On this account a simple list showing roughly the calorific values of the various foods commonly given to young children will furnish results sufficiently accurate in ordinary practice. Such a table has been suggested by C. H. Smith.[4] The amounts are calculated to a level tablespoonful, approximately half an ounce, which seems to be the most convenient measure to use in the household, as given in Table 6. With the use of this list the heat units in any ordinary diet can be determined readily.

Table 7 gives a diet on which a boy of 9 years, weighing 66 pounds, 30 kilograms, thrived. This diet

TABLE 6.—CALORIFIC VALUE OF SOME COMMON FOODS

One Level Tablespoonful, About ½ Ounce	Calories
Cane sugar	60
Cream (16 per cent.)	50
Butter	115
Fruit pulp	10
Baked apple	15
Cereals	10
Mashed vegetables	15
Clear soup	5
Puree of vegetable	15
Meat of fish	25
Milk	10
Cocoa	15
One cracker	30
One thick slice of bread	75
One piece of toast, thin	25
One egg	75
Custard, soft	30

provided 1,970 calories, about 65 per kilogram, or 30 per pound. In it there is increasingly larger proportions of vegetable protein than in the list for younger children. It is of course understood that there will be considerable daily variations in the nutritive and calorific values of a given diet, depending on what

4. Smith, C. H., quoted by Wachenheim: Infant Feeding, Philadelphia, Lea & Febiger, 1915, p. 316.

particular cereal is used, what meat or what variety of green vegetables, etc. Extreme accuracy has no practical advantage, and if the diet, especially for older children, is varied from day to day, the weekly average will be fairly constant. It is advisable for the physician to have a list of a number of suitable cereals, green and white vegetables, simple desserts and fruits, any one of which can be substituted for another of the same group. There is sometimes an advantage in preparing three or four daily diets, which can be used in succession, rather than to leave the selection entirely to mother or nurse. One delicate child we saw recently did not gain, although careful general directions as to diet had been given, until three varied diet lists, each having about the same number of heat units, were furnished.

It was the object of this paper simply to call attention to such meager data as we have at our disposal concerning the average food requirements of young and growing children, to outline such diets as would satisfy these requirements, and to suggest further that it is a simple matter to calculate in a general way the calorific value of a given diet so that at least a child's need may be satisfied and on the other hand that he may escape continuous overfeeding. It is understood, of course, that there are great individual differences in the digestive capacity of young children, and that some children will grow on a diet much lower than the average.

TABLE 7.—DIET ON WHICH A BOY OF 9 YEARS, WEIGHING 66 POUNDS, THRIVED

		Calories
Breakfast	Toast, 2 pieces	75
	Butter, ½ ounce*	60
	Cereal, 3 ounces	75
	Egg, 1 ounce	75
	Sugar, ½ ounce	30
	Cocoa, 7 ounces	200
		510
Dinner	Broth, 6 ounces	60
	Meat, 2 ounces	100
	Green vegetables, 3 ounces	50
	Potato, 3 ounces	50
	Rice, 3 ounces	50
	Bread, 2 slices	150
	Butter, ½ ounce	120
	Dessert (custard), 4 ounces	160
		800
Supper	Toast, 3 slices	75
	Egg, one	75
	Butter, ½ ounce	115
	Milk, 8 ounces	160
	Baked apple, 3 ounces	90
		515

* One level teaspoonful equals one-half ounce.

The method outlined enables the physician to check the food of growing children in some such manner as he would do that of an infant, and is a valuable aid in careful feeding at a most important age period in life. Much depends on the quality of the food and on its cooking. The physician must be prepared to give specific directions as to the preparation of the child's food. The alteration of the diet required in various diseased conditions, it is not the intention of this paper to discuss. Certain ailments, such as scurvy, tetany, the various diatheses, indigestion, constipation, diarrhea and anemia may be due entirely to ill-adapted diets and can be cured when these are corrected. In such cases this can be accomplished without seriously lowering the calorific value if the physician knows how to make the proper substitutions. By this natural method a considerable proportion of drugs now freely dispensed can be omitted. It has been pertinently asked by Professor Mendel why physicians take so much care in measuring their doses of drugs, which are administered only occasionally, and so little care in measuring their food prescriptions, which are to be followed daily.

211 Wendover Road.

Therapeutics

BLOOD PRESSURE

(Continued from page 359)

BLOOD PRESSURE AND PREGNANCY

Evans[25] of Montreal studied thirty-eight pregnant women who had eclampsia, albuminuria and toxic vomiting, and found the systolic pressures to vary from 200 to 140 mm. He did not find that the highest pressures necessarily showed the greatest insufficiency of the kidneys, but that the blood pressure must be considered in conjunction with other toxic symptoms. In thirty-two cases he was compelled to induce labor when the blood pressure was 150 mm. or under, while in four cases with a blood pressure over 150 mm., the toxic symptoms were so slight that the patients were allowed to go to term and had natural deliveries.

A rising blood pressure in pregnancy, when associated with other toxic symptoms, is indicative of danger, and Evans believes that a systolic pressure of 160 mm. is ordinarily the danger limit.

Newell[26] has studied the blood pressure during normal pregnancy, and finds that when the systolic pressure is persistently below 100, the patient is far below par, and that the condition should be improved in order for her to withstand the strain of parturition. When the systolic pressure is above 130, the patient should be carefully watched, and he thinks that 150 is the danger line. Some pregnant women have an increasing rise in blood pressure throughout the pregnancy, without albuminuria. In other cases this rise is followed by the appearance of albumin in the urine. Thirty-nine of the patients studied by Newell had albumin in the urine without increase in blood pressure; hence he believes that a slight amount of albumin may not be accompanied by other symptoms. Five patients had a blood pressure of 140 or over throughout their pregnancy, and in only one of these patients was albumin found. All passed through labor normally, showing that a blood pressure below 150 may not necessarily be indicative of a serious condition; but a patient who has a systolic pressure over 135 must certainly be carefully watched. A fact brought out by Newell's investigations is very important, namely, that a continuously increased blood pressure is not as indicative of trouble as when a blood pressure has been low and later suddenly rises.

Hirst[27] also urges that a high blood pressure in pregnancy does not necessarily represent a toxemia, and also that a serious toxemia can occur with a blood pressure of 130 or lower, although such instances are rare. Hirst believes that when a toxemia is in evidence in pregnancy while the blood pressure is low, the cause of the toxemia is liver disturbance rather than kidney disturbance, and he thinks this form of toxemia is more serious and has a higher mortality than the nephritic type. Therefore in a patient with eclamptic symptoms

25. Evans: Month. Cyc. and Med. Bull., November, 1912, p. 649.
26. Newell, F. S.: The Blood Pressure During Pregnancy, THE JOURNAL A. M. A., Jan. 30, 1915, p. 393.
27. Hirst: Pennsylvania Med. Jour., May, 1915, p. 615.

and a low blood pressure, the prognosis is more unfavorable than when the blood pressure is high. He believes that if high blood pressure occurs early in the months of pregnancy, there is preexisting, although perhaps latent, nephritis. In these conditions the diastolic pressure is also likely to be high.

With the patient eclamptic and stupid, whatever the date of the pregnancy, Hirst would do venesection immediately in amount from 16 to 24 ounces, depending on what amount seems advisable. If venesection is done before actual convulsions have occurred, the blood pressure falls temporarily but rapidly rises again. He finds that if a patient is past the eighth month, rupture of the membranes will usually bring a rapid fall of from 50 to 90 points in systolic pressure. Usually, of course, such rupture of the membranes will induce labor. He finds that the fluidextract of veratrum viride is valuable when eclampsia is in evidence or imminent. He gives it hypodermically, 15 minims at the first dose and 5 minims subsequently, until the systolic pressure is reduced to 140 or less. He admits that this is rather strenuous treatment. He does not speak of treatment by thyroid extracts, which has been regarded as valuable by some other workers.

In these patients who show eclamptic symptoms, he maintains a milk diet, and purging and sweating. It should be remembered that venesection or profuse bleeding during induced parturition is more valuable than sweating in all eclamptic cases and in all nephritic convulsions. Profuse sweating does little more than take the water out of the blood, and even concentrates the poisons in the blood.

Hirst causes purging by 2 ounces of castor oil and a few minims of croton oil. He also advises large doses of magnesium sulphate. In such serious disturbances as eclampsia, it is not necessary to give a magnesium salt, which, it has been shown, can have unpleasant action on the nervous system. Sodium sulphate is as valuable and is not open to this danger.

Hirst urges that whatever the blood pressure, with albuminuria, as soon as persistent headache occurs, and especially if there are disturbances of vision, the pregnancy must be terminated at once. On this there can be no other opinion. Temporizing with such a case is inexcusable.

After labor has been induced there is an immediate fall of blood pressure, which lasts some hours. The pressure will again rise, and usually is the last sign of toxemia to disappear, and he finds that this increased pressure may last from two to three weeks when there is not much nephritis, and several months when there is nephritis.

Although he says he has found no bad action from ergot, either by the mouth or hypodermically in these eclamptic cases, it would seem inadvisable to use ergot, which may raise the blood pressure. He finds that pituitary extract "can cause dangerous rise of blood pressure."

Pellissier[28] believes that when there is prolonged vomiting in early pregnancy, with an increase in systolic blood pressure, and with an increased viscosity of the blood, the outlook is serious, and active treatment should be inaugurated.

Irving[29] reports, after a study of 5,000 pregnant women, that in 80 per cent. the systolic blood pressure varied from 100 to 130; in 9 per cent. it was below 100, at least at times, but a pressure below 90 does not mean that the woman will suffer shock; in 11 per cent. the pressure was above 130, and high pressure in young pregnant women more frequently indicates toxemia than when it occurs in older women; high pressure is more indicative of toxemia than is albuminuria; a progressively increasing blood pressure is of bad omen, and most cases of eclampsia occur with a pressure of 160 or more, but eclampsia may occur with a moderate blood pressure. Irving believes that with proper preliminary preventive treatment most eclampsia is preventable.

(*To be continued*)

28. Pellissier: Archiv. mens. d'obst. et de gynéc., Paris, 1915, iv, No. 5.
29. Irving, F. C.: The Systolic Blood Pressure in Pregnancy, THE JOURNAL A. M. A., March 25, 1916, p. 935.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION. THEIR ACCEPTANCE HAS BEEN BASED LARGELY ON EVIDENCE SUPPLIED BY THE MANUFACTURER OR HIS AGENT AND IN PART ON INVESTIGATION MADE BY OR UNDER THE DIRECTION OF THE COUNCIL. CRITICISMS AND CORRECTIONS ARE ASKED FOR TO AID IN THE REVISION OF THE MATTER BEFORE PUBLICATION IN THE BOOK "NEW AND NONOFFICIAL REMEDIES."

THE COUNCIL DESIRES PHYSICIANS TO UNDERSTAND THAT THE ACCEPTANCE OF AN ARTICLE DOES NOT NECESSARILY MEAN A RECOMMENDATION, BUT THAT, SO FAR AS KNOWN, IT COMPLIES WITH THE RULES ADOPTED BY THE COUNCIL.

W. A. PUCKNER, SECRETARY.

FIBRIN FERMENT AND THROMBOPLASTIC SUBSTANCES (KEPHALIN)

The clotting of blood (that is, the transformation of the fibrinogen of circulating blood into the insoluble fibrin of blood-clot) has been shown to be due to the action of the fibrin ferment (thrombin) on the fibrinogen of the blood. The fibrin ferment or thrombin exists in the blood in the form of its forerunner (prothrombin) which is acted on by the calcium salts and converted into thrombin. Besides calcium salts, however, another factor is necessary. In spite of a sufficient supply of calcium salts, blood does not clot spontaneously within the vessels. This other factor may be furnished from the breaking down of blood cells or blood platelets or from the pieces of tissues that are cut or badly injured. It has been designated as "zymoplastic" substance by Schmidt, as "thrombokinase" by Morowitz, and as "thromboplastic substance" or "thromboplastin" by Howell (*Am. Jour. Physiol.*, 1912, xxxi, 1). Howell believes that the reason that blood does not coagulate within the vessels is that the prothrombin exists there in combination with an antithrombin, which prevents it from acting. He believes that when blood is shed or flows over injured tissue the thromboplastin derived from blood cells, blood platelets or tissue cells combines with this antithrombin, liberating the prothrombin from combination with the latter. The prothrombin thus liberated now combines with the calcium salts, is converted into thrombin and converts the fibrinogen of the plasma into fibrin, causing coagulation to set in. Howell has shown that thromboplastin or "thromboplastic substance" from every source in which he has investigated it gives the reactions of the lipoid kephalin—the main lipoid of the brain. It is soluble in ether, but insoluble in water, alcohol and acetone, and kephalin prepared from the brain possesses the same action.

Actions and Uses.—Preparations containing thromboplastin are said to be useful when applied locally in the treatment of hemorrhages, especially hemorrhages from oozing surfaces, scar tissues and nosebleeds, and in surgery of the bones, glands, nose and throat. When injected subcutaneously or intravenously such preparations are said to

shorten the coagulation time of the blood for a period of about twenty-four hours, but there may be a certain danger of a negative phase setting in. Such injections are contraindicated in cases in which there is a tendency to thrombosis or embolism; for example, in arteriosclerosis, aneurysm, heart weakness, phlebitis, certain stages of syphilis, and in varicose veins. Injections of kephalin seem to have little effect in hemophilia (Hurwitz and Lucas: *Arch. Int. Med.*, 1916, xvii, 543). Preparations should be standardized by testing on specimens of blood in vitro, which should be able to bring the coagulation time to about one third of its original length; they should be proven sterile, particularly if intended for intravenous use.

BRAIN LIPOID.—Impure Kephalin.—An ether extract of the brain of the ox, or other mammal, prepared according to the method of Howell as applied in practice by Hirschfelder (*Lancet*, 1915, ii, 542) (see below).

Actions and Uses.—See general article, fibrin ferments and thromboplastic substances (kephalin).

Dosage.—Brain lipoid may be smeared on gauze sponges, pledgets, or on the tissues themselves; or an emulsion in sodium chloride may be prepared by shaking up with physiologic saline solution and used in the same way or sponged over the tissues.

For use in an office or dispensary, the ether extract suffices and can be kept ready for use for some time (several weeks) in a sterile dropper bottle from which an opalescent emulsion in salt solution can be prepared at a moment's notice by dropping 10 to 30 drops into an ounce of physiological saline solution and then shaking up. This solution can also be dispensed from drug stores, provided the opening in the stopper of the dropper bottle is kept slightly open to prevent blowing off of the ether on shaking or heating.

Brain lipoid (impure kephalin) is prepared from ox brain which is run through a hashing machine, then covered with three volumes of alcohol, shaken up two or three times, and the excess of alcohol then poured off and squeezed out gently through linen, care being taken to avoid great force in wringing out the alcohol, as this tends to break up the brain tissue into very finely divided particles which pass through the filter. The residue is then covered with three volumes of ether, shaken vigorously and filtered first through cotton and then through filter paper. The clear filtrate thus obtained is evaporated to dryness over a water bath and a yellow residue of fatty appearance and consistency remains. (This residue consists largely of kephalin, but though the latter is not in the pure state, it is extremely active in accelerating the clotting of blood in vitro).

The method of preparation renders it sterile. It can be transferred on a sterile spatula or knife blade to sterile vessels. It retains its activity for several weeks.

(The impurities present, largely the lecithins and myelins, do not materially detract from the activity of the kephalin, but, on the contrary, facilitate its emulsification in saline solution and thus facilitate its intimate miscibility with blood.)

SOLUTION BRAIN EXTRACT.—Solution Thromboplastin-Hess.—An extract of ox brain in physiological salt solution prepared by the method of Hess (THE JOURNAL A. M. A., lxvi, 558, Note 2).

Actions and Uses.—See general article, fibrin ferment and thromboplastic substances (kephalin).

Dosage.—The solution may be applied directly to the bleeding tissues or sprayed on them, or a sponge or tampon may be immersed in it and then pressed on the bleeding surface.

Ox brains are obtained fresh from the slaughter-house, stripped of their membranes, washed in running water and weighed. They are then passed through a meat chopping machine three times, and an equal amount of normal salt solution is added. This suspension is allowed to remain in the refrigerator for forty-eight hours, and it is then twice pressed through cheese-cloth. This extract, which contains fine suspension of tissue in addition to tissue juice, is diluted with one half its quantity of salt solution. Cresol is then added in proper proportion so that the finished preparation contains 0.3 per cent. It maintains its hemostatic potency for some time (several weeks). (Since cresol is not a perfect antiseptic the sterility of this preparation cannot be guaranteed.)

GALACTENZYME TABLETS.—Tablets Bacillus Bulgaricus-Abbott.—Tablets containing a practically pure culture of *Bacillus bulgaricus* (Type A).

Actions and Uses.—Galactenzyme tablets are designed for internal administration in the treatment of intestinal fermentative diseases by the Bulgarian bacilli, with the design of obtaining the growth in sufficient number of the bacilli in the alimentary tract, so as to secure their characteristic action against putrefactive fermentation by the production of lactic acid.

Dosage.—One, two, or three tablets three times a day with meals. The diet should be regulated to meet the condition which may be present.

Galactenzyme tablets are marketed in bottles, each containing 100 tablets. The tablets must be kept in a cold place and are not guaranteed beyond the date stamped on the label.

Manufactured by the Abbott Laboratories, Chicago. No U. S. patent or trademark.

Cultures of a pure and virile strain of *Bacillus bulgaricus* (Type A) are grown on sterilized milk. This milk culture of the organism is mixed with purified milk sugar. The mixture is dried in a stream of sterile, filtered air, at low temperature, and the dried product compressed into tablets under aseptic conditions.

GALACTENZYME BOUILLON.—Suspension of Bacillus Bulgaricus-Abbott.—A pure culture in vials of *Bacillus bulgaricus* (Type A), each vial containing about 6 Cc.

Actions and Uses.—Galactenzyme bouillon is designed for internal administration in the treatment of intestinal fermentative diseases with the design of obtaining the growth in sufficient number of the bacilli in the alimentary tract so as to secure their characteristic action against putrefactive fermentation. It is also used for topical applications in nasal, aural, throat, urethral and other affections when the use of such a culture is indicated.

Dosage.—The contents of one vial in a little sweetened water or milk, once or twice daily, preferably on an empty stomach. A small quantity of carbohydrate food should be included in the dietary.

Galactenzyme bouillon is supplied in packages of twelve vials. It must be kept in a cold place, and is not guaranteed beyond the date stamped on the label.

Manufactured by the Abbott Laboratories, Chicago. No U. S. patent or trademark.

Cultures of a pure and virile strain of *Bacillus bulgaricus* (Type A) are grown in a specially prepared bouillon.

MERCURIC SALICYLATE (see N. N. R., 1916, p. 195).—The following dosage form has been accepted:

Ampuls Mercuric Salicylate-Squibb, 0.065 Gm.—Each ampule contains mercuric salicylate 0.065 Gm. (1 grain) in 1 Cc. of sterile suspension. Prepared by E. R. Squibb & Sons, New York.

QUININE DIHYDROCHLORIDE (see N. N. R., 1916, p. 260).—The following dosage forms have been accepted:

Ampoules Quinine Dihydrochloride-Squibb, 1 Gm.—Each ampule contains quinine dihydrochloride 1 Gm. (15½ grains) in 2 Cc. of sterile solution. Prepared by E. R. Squibb & Sons, New York.

Ampoules Quinine Dihydrochloride-Squibb, 0.5 Gm.—Each ampule contains quinine dihydrochloride 0.5 Gm. (7½ grains) in 2 Cc. of sterile solution. Prepared by E. R. Squibb & Sons, New York.

Ampoules Quinine Dihydrochloride-Squibb, 0.25 Gm.—Each ampule contains quinine dihydrochloride 0.25 Gm. (3¾ grains) in 2 Cc. of sterile solution. Prepared by E. R. Squibb & Sons, New York.

QUININE AND UREA HYDROCHLORIDE (see N. N. R., 1916, p. 262).—The following dosage forms have been accepted:

Ampoules Quinine and Urea Hydrochloride-Squibb, 1 Gm.—Each ampule contains quinine and urea hydrochloride 1 Gm. (15½ grains) in 2 Cc. of sterile solution. Prepared by E. R. Squibb & Sons, New York.

Ampoules Quinine and Urea Hydrochloride-Squibb, 0.5 Gm.—Each ampule contains quinine and urea hydrochloride 0.5 Gm. (7½ grains) in 2 Cc. of sterile solution. Prepared by E. R. Squibb & Sons, New York.

Ampoules Quinine and Urea Hydrochloride-Squibb, 0.25 Gm.—Each ampule contains quinine and urea hydrochloride 0.25 Gm. (3¾ grains) in 2 Cc. of sterile solution. Prepared by E. R. Squibb & Sons, New York.

Ampoules Quinine and Urea Hydrochloride-Squibb, 1 per cent.—Each ampule contains 5 Cc. of a sterile 1 per cent. solution of quinine and urea hydrochloride. Prepared by E. R. Squibb & Sons, New York.

SODIUM CACODYLATE (see N. N. R., 1916, p. 49).—The following dosage forms have been accepted:

Ampoules Sodium Cacodylate-Squibb, 0.13 Gm.—Each ampule contains sodium cacodylate 0.13 Gm. (2 grains) in 1 Cc. of sterile solution. Prepared by E. R. Squibb & Sons, New York.

Ampoules Sodium Cacodylate-Squibb, 0.05 Gm.—Each ampule contains sodium cacodylate 0.05 Gm. (¾ grain) in 1 Cc. of sterile solution. Prepared by E. R. Squibb & Sons, New York.

Requisites of Conversation.—In conversation, humor is more than wit, easiness more than knowledge; few desire to learn, or to think they need it; all desire to be pleased, or, if not, to be easy.—Sir William Temple.

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SATURDAY, AUGUST 5, 1916

THE PROTECTION OF MICRO-ORGANISMS

"'If ever there was a romantic chapter in pathology, it has surely been that of the story of phagocytosis.' So said the late Lord Lister in his presidential address to the British Association in 1896, and so we, with equal fervor, say today when many more pages of the story have been turned over."[1] The term "phagocyte" was coined to designate the ameboid cells capable of seizing and digesting micro-organisms, red blood corpuscles and other formed structures. The property of phagocytosis is an attribute of a considerable number of different varieties of cells besides the more familiar representatives present in the circulating blood and tissue fluids. Zinsser[2] states that among the fixed cells of the body it is probable that phagocytosis may be carried on by cells of many different origins, though the identification of cells in tissues is often a purely morphologic problem, and therefore fraught with many possibilities of error. Probably the most active fixed tissue cells are the endothelial cells of the blood vessels and those which line the serous cavities and the sinuses of the lymph nodes and of the spleen. In addition to these, however, there are many other cells which may be phagocytic. Zinsser and Carey have observed the active phagocytosis of leprosy bacilli by cells, probably of connective tissue origin, growing from plants of rat spleen in plasma. Phagocytosis by the cells lining the alveoli of the lungs has been observed by Briscoe. This author made the interesting observation that in cases of mild infection such cells can free the lungs of micro-organisms entirely without aid from the leukocytes of the circulating blood. It is these cells, too, which, in the ordinary conditions of life, take up the inhaled particles of dust and are often spoken of, therefore, as dust cells. These flattened cells are probably of epithelial origin, and as such are probably the only epithelial cells which act as phagocytes under ordinary conditions. Although no positive general statement is justified, we can yet say with reasonable accuracy that among the phagocytic fixed tissue cells the most important are the connective tissue and endothelial cells.

The dominant conception in the minds of those who have dealt with these phagocytic phenomena has been the purposeful character of the process with the end of destruction of the ingested organism in view. Rous and Jones,[3] of the Rockefeller Institute for Medical Research, have pointed out that the possibility that in certain instances cells not only fail to kill the organisms they ingest, but actively protect them from circulating antibodies, seems not to have been considered. In illustration of the significance which this topic may have, it is pointed out that there are a number of important diseases, among them leprosy, tuberculosis, gonorrhea and leishmaniosis, caused by microbic parasites which live more or less habitually within tissue cells.

The New York investigators have contributed important facts which should be taken into consideration in the study of diseases caused by infectious agents capable of living within tissue cells. They have demonstrated definitely that living phagocytes are able to protect ingested micro-organisms from the action of destructive substances in the surrounding fluid, and even from a strong homologous antiserum. There is evidence that the protection by the phagocytes is largely if not entirely conditioned on their being alive. It remains to be determined, Rous and Jones write, how far the protection of micro-organisms by living tissue cells, especially cells incapable of killing the micro-organisms, is important in disease processes. The phenomenon may have much to do with the survival in the animal body of organisms such as the leprosy bacillus, which is so often found living within cells of the fixed tissues; and it may serve to explain in part the therapeutic difficulties in such instances. It may throw light, the writers further add, on the formation of new disease foci at points of injury in individuals of high general resistance. For if an infective agent can be "walled off" from the action of the body fluids by the protoplasm of a single cell containing it, there is no reason, as Rous and Jones conclude, why it should not be carried unharmed wherever this cell goes.

THE REACTION OF THE PANCREAS AND THE PANCREATIC JUICE

It is generally accepted that the chemical reaction of living tissues, like that of the blood, is slightly alkaline or neutral. On impairment of circulation and oxidation, or on death of the tissues, an acid reaction quickly develops, owing to the accumulation of acid metabolites and waste products. In life the organs, like the blood, appear to have the power to maintain practical neutrality even under quite varied physiologic conditions. As applied to the pancreas, this general conception has recently been called in question in a

1. The quotation is from Fraser, Elizabeth T.: A Manual of Immunity, Glasgow, 1912, p. 57.

2. Zinsser, Hans: Infection and Resistance, The Macmillan Company, New York, 1914, p. 278.

3. Rous, Peyton, and Jones, F. S.: The Protection of Pathogenic Micro-Organisms by Living Cells, Jour. Exper. Med., 1916, xxiii, 601.

series of papers by Long and Fenger.[1] These investigators report that the living pancreas of all animals so far investigated has an acid reaction, whether tested by indicators, by titration, or by the electrical conductivity methods. The acidity is practically constant, and does not vary with the seasons or the animal's diet.

Most of the tests were made on press juice from the macerated organ, separated by the centrifuge. Applying this method to other organs, they found that the liver, spleen and salivary glands usually give an acid reaction, but much less than the pancreas, while the press juice of the fresh thyroid gland is neutral in reaction. They conclude that "the acid reaction of the pancreas is undoubtedly a normal one, and it has been overlooked, because the outflow from the fistula (the pancreatic juice) is so plainly alkaline." In the first paper it is suggested that "during the normal activity of the pancreas the work of the cells results in sending an excess of alkaline phosphates to the intestines, while an excess of the acid phosphates is retained to make the gland tissue slightly acid." This is a new conception of the mechanism of alkalinity of the pancreatic juice. It is well known that the alkalinity of normal pancreatic juice is equal to about 0.5 per cent. sodium carbonate, and it has been generally held that it is actually due to the excess of alkaline carbonates, the trace of phosphoric acid hitherto reported in the juice not being sufficient to account for the alkalinity on the basis of alkaline phosphates. In their second paper the authors show by chemical (quantitative) analyses that the marked acid reaction of the pancreas is due to the presence of acid phosphates and acid nucleoproteins. But practically no evidence is adduced to show that the alkalinity of the pancreatic juice itself is due primarily to alkaline phosphates rather than to carbonates. The reason advanced for the accumulation of acid phosphates in the gland itself in the course of normal activity remains, therefore, an interesting hypothesis.

When the minced pancreas is centrifugalized, the material separates into three layers: a top layer of fatty material, a middle layer of clear fluid, and a bottom layer of proteins and débris. Most of the trypsin is found in the bottom layer, while the lipase and the diastase pass mainly to the clear liquid. When the pancreas is thus treated, the trypsinogen is activated. This is in harmony with reports of previous investigators to the effect that trypsinogen is activated on standing, and by weak acids, etc. They also find that the trypsin thus obtained acts best in a slightly alkaline medium, just as is the case with normal pancreatic juice, "while the fluid itself in which the ferments are elaborated is distinctly acid." This applies, of course, not to the normal living cell, or to the normal pancreatic juice, but only to the pancreas press juice of Long and Fenger. And it would perhaps be more correct to speak of the liberation rather than the elaboration of the ferments in the press juice.

The fact that, with the methods employed, an organ like the spleen having no external secretion also gives an acid reaction seems to show that the theory of Long and Fenger of a balance between cell secretion and cell retention is inadequate to explain their high acid findings in the pancreas. In any event, there must be a continuous adjustment of chemical reaction between the tissue cells and the blood, for the pancreas, in health, is secreting pancreatic juice continuously, and on the theory of Long and Fenger, this should lead to an increased storage of acid phosphates within the cells themselves. The problem of the mechanics of the change in chemical reaction of body fluids under the influence of lining cells, as in the case of the urine and the gastric juice, is as yet far from solution. The work of Long and Fenger may be the starting point of its solution for the pancreas and the pancreatic juice.

1. Long, J. H., and Fenger, E.: On the Reaction of the Pancreas, Jour. Am. Chem. Soc., 1915, xxxvii, 2213; ibid., 1916, xxxviii, 1114. Long, J. H.: Hull, Mary, and Atkinson, H. V.: Ibid., 1915, xxxvii, 2427.

THE DIARRHEA OF CHILDHOOD

The diarrheas of childhood are important because of their urgency, and attract attention because of certain features which make them somewhat distinct from the comparable gastro-intestinal disturbances of later years. Errors of diet may not be more common in infancy and childhood than at subsequent periods of life, and the cause of diarrhea in the earlier years may be essentially the same as later; but somehow they appear to be attended with more serious consequences. A consideration of literature of recent years will bring to mind numerous investigations tending to associate some of the types of infantile diarrhea with the presence of well recognized bacteria, for example, the Shiga bacillus, in the digestive tract. There is little doubt, however, that clinically indistinguishable forms of diarrhea are related to other micro-organisms, if not caused by them, so that it has even been thought probable that, after all, there may be no specific bacillus responsible for this common disorder of childhood. Furthermore, inasmuch as various foods or indiscretions in diet have often appeared to bear some relation to the onset of the symptoms, it has repeatedly seemed not unlikely that products of bacterial decomposition either arising in the food or formed from it in the intestinal tract must share the chief responsibility for the production of the diarrhea and vomiting.

With such thoughts in mind, Mellanby[1] working at the London Hospital Medical College under the auspices of the Local Government Board, has attempted to elucidate the pathogenesis of diarrhea in children along chemical lines rather than by the conventional study of its purely bacteriologic aspects. This procedure certainly seems justifiable in view of the failure

1. Mellanby, E.: An Experimental Investigation of Diarrhoea and Vomiting of Children, Quart. Jour. Med., 1916, ix, 165.

of previous research to associate the disorder definitely with any causal factor, either bacterial or chemical. In searching for a possible chemical cause for symptoms such as diarrhea and vomiting, depression of the respiratory center, fall of blood pressure, and coma, encountered in children who are affected, Mellanby selected betaimidazolylethylamin. This substance has been discovered in recent years not only as an extremely active and toxic substance isolated by Barger and Dale[2] from ergot, but also as an occasional constituent of the alimentary tract of animals. It owes its origin in the latter case to the bacterial disintegration of the amino acid histidin derived from proteins. Micro-organisms capable of producing the amin from the amino acid have actually been isolated from the intestine.

Employing betaimidazolylethylamin, then, as a representative toxic product of alimentary bacterial origin, Mellanby has studied the conditions which may favor or retard its formation or absorption. Among the results which may have a practical bearing on the subject of diarrhea and vomiting of children, it was found that there is a marked delay in the absorption of toxic substances, normally in the intestine, when animals are injected with large quantities of fluid. During the digestion of foodstuffs generally there is a similar delay; likewise the presence of water and the presence of bile in the bowel delay the absorption of toxic substances. The resistance against such products is greatly increased by injection of fluid into the circulation, and diminished with a decreased amount of fluid, particularly after the loss of blood. Without entering into the hypothetic details as to how such consequences may arise, it will suffice to point to Mellanby's conclusions by analogy: A child suffering from diarrhea and vomiting owing to loss of fluid and loss of bile salts, with an empty intestine and in a starving condition, is in an ideal position for allowing toxic substances ordinarily present in the alimentary canal and mucous membrane to be absorbed rapidly and have their full toxic action. Perhaps the association of this disease with a high atmospheric temperature in an epidemic form is to be explained largely by the additional loss of fluid due to evaporation of water in the body's attempt to keep its temperature normal.

In the light of the artificial conditions obtaining in the experiments cited, the first essential of treatment ought to consist in restoring the normal volume of body fluids or even exceeding the usual condition in this respect; otherwise undesirable absorption will be increased, and with a suppressed production of alimentary secretions, food will be decomposed rather than digested in the intestine. Water should be freely administered to diarrheic children, by mouth if possible. Drugs like morphin and opium are to be avoided. Feeding is not contraindicated, since it brings the secretory apparatus into play. Such suggestions are admittedly tentative and, being evolved through scientific inquiry, deserve quite as careful consideration as do the therapeutic procedures which have been dictated by empiric methods. Some account will doubtless need to be taken of the acidosis factor which Howland has emphasized. Where uncertainty exists, any rational suggestion must be welcomed. As Mellanby remarks, if the methods evolved from laboratory work are radically inefficient when applied to the specific clinical cases, one can only assume that the experimental conditions omit some essential factor — they do not sufficiently resemble the pathologic condition encountered in the disease.

2. Barger, G., and Dale, H. H.: Jour. Physiol., 1910, xl, Proc. 37; ibid., 1910-1911, xli, 499.

THE METABOLISM IN ANEMIAS AND DYSPNEIC CONDITIONS

The helpful service which clinical calorimetry is performing in the development of scientific medicine is not confined to one or two diseases to which reference was recently made.[1] Pernicious anemia, likewise still a puzzling malady, has claimed a share of attention from the investigators of the Russell Sage Institute of Pathology, in affiliation with the Second Medical Division of Bellevue Hospital, New York.[2] This newer work differs from many of the earlier investigations in that the observations on the metabolism of the disease were made on patients instead of animals. Most anemias in the latter have been induced artificially by hemorrhage. When we come to the application of experimental methods to clinical anemia, the problem at once becomes decidedly more complicated. In addition to the simple anemias, there is the unique type of pernicious anemia. Chlorosis and leukemia may be included in the category because of their low hemoglobin content. Any difference that the clinical forms show may, quite apart from refinement of technic, be ascribed to essential differences between anemias artificially induced and anemias arising from pathologic agencies.

It is a natural assumption that a paucity of hemoglobin, such as one finds in anemias, must seriously impair the oxidative processes in the body and thus alter the metabolism. A decline in metabolic functions might even be expected. The facts are, however, that a reduction in the hemoglobin does not preclude the possibility of either a normal or an augmented metabolism. There is no evidence that metabolism runs its course on a lower plane in anemia. The demand for oxygen may far exceed the demand in health. But the compensatory processes in uncomplicated cases of pernicious anemia are capable of meeting the demand in

1. The Basal Metabolism in Obesity, and Its Significance, editorial, The Journal A. M. A., July 22, 1916, p. 288; Clinical Calorimetry, July 22, 1916, p. 286; New Studies of Exophthalmic Goiter, July 29, 1916, p. 360.

2. Meyer, A. L., and Du Bois, E. F.: Clinical Calorimetry, Fifteenth Paper, The Basal Metabolism in Pernicious Anemia, Arch. Int. Med., June, 1916, p. 965.

spite of a greatly diminished hemoglobin content. What these are, beyond the usual surplus of oxygen in normal tissues, is not yet clear.

The increase in metabolism shown in severe cases of pernicious anemia is commented on by Meyer and Du Bois in the way of a possible explanation through reference to well-known researches showing that muscles poorly supplied with oxygen are functionally less efficient. Accessory muscles are called on to cooperate in the accomplishment of any task. The mechanism of the vital function of respiration and circulation becomes more complex. Proper breathing requires the activity of muscles which ordinarily play no rôle in respiration. Again, the respiratory muscles may serve in securing a more efficient circulation. In general, activity implies unusual effort, and hence the demand for additional oxygen. Thus Meyer and Du Bois conclude that there is some ground for the belief that the height of metabolism is a measure of the severity of the clinical pictures.

Another instance wherein an increased metabolism due to augmented muscular activity might be expected is furnished by dyspneic patients who must do additional muscular work in their labored breathing. Of five patients with moderately severe dyspnea, studied in the Sage calorimeter by Peabody, Meyer and Du Bois,[3] all but one showed a distinct increase in metabolism. Other patients, among the cardiorenal cases, with slight dyspnea also showed some increase. To these most recent investigators the increases seem too large in many cases to be attributable to the extra muscular activity alone. They add that evidently in complex groups of cardiacs and nephritics there are many factors at work, no one of which at present can be called on to account for the definite increase in metabolism found in dyspneic subjects. Individuals with compensated cardiac lesions or with mild nephritis, however, showed a metabolism within normal limits.

Current Comment

THE POISONOUS PRINCIPLE OF POISON OAK

Poison oak, *Rhus diversiloba* T. and G., of the Pacific slope is closely related botanically to the poison ivy, *Rhus toxicodendron* L., of the Eastern states. The toxic effects produced by these plants are believed to be identical and are familiar to most physicians. Two other closely related plants, the Japanese poisonous sumac, *Rhus vernicifera* D. C., and the American poisonous sumac, *Rhus vernix* L., produce similar toxic effects. These sumacs are related to poison ivy and poison oak, though the relationship is not so close as that between the two plants last mentioned. A number of chemists have studied the toxic principles of these two sumacs, but until recently no investigation of the chemistry of the poisonous principle of poison oak had been undertaken. It has been pretty definitely settled that the poisonous principle of the sumacs is an amber colored, nonvolatile liquid resin which has acidic and phenolic properties, and which may be readily oxidized to a black, lustrous, durable varnish. Stevens and Warren[1] have shown that there is considerable likelihood that the poisonous principle of poison ivy is identical with that in poison sumac. The results of their investigations were in accord with those of Pfaff,[2] but did not agree with those of Syme and Acree,[3] who believed that the poisonous principle of ivy was a complex glucosid of rhamnose, gallic acid and fisetin. McNair,[4] in an investigation of the toxic constituent of poison oak, found no evidence of fisetin, rhamnose or gallic acid, but does not offer any explanation of the nature of the active principle. In view of the close botanic relationship between poison oak and poison ivy it seems probable that the active principles of the two plants are identical; it is regrettable that McNair's investigations have not settled this question.

ANALYSES OF NORMAL HUMAN BLOOD

In emphasizing, in a recent number of THE JOURNAL,[5] that the shifting of interest in metabolism to a study of the chemistry of the blood calls for elaborate fundamental data on the normal composition of the circulating fluid, we scarcely expected this requirement to be met within a few days. However, it is gratifying to record evidence of an independent appreciation of this point of view from the Laboratory of Pathological Chemistry at Bellevue Hospital, New York. To the valuable statistics on the nonprotein nitrogen content of blood secured by Folin and Denis,[6] Myers and Fine,[7] McLean and Selling,[8] Taylor and Hulton,[9] Greenwald,[10] Hohlweg,[11] and more recently Bang,[12] among others, there are now available exceptionally complete chemical and physical analyses of blood[13] in thirty normal persons of both sexes and ages ranging from 17 to 60. Realizing that the values given in the literature disagree more or less and that in few cases have the various determinations been made on the individuals under strictly comparable conditions or on the same sample of blood, Gettler and Baker decided to adhere to some standard conditions which could easily be maintained in similar work on patients in the hospital. The plan included a uniform hospital breakfast, blood withdrawal three hours thereafter, and the prompt

3. Peabody, F. W.; Meyer, A. L., and Du Bois, E. F.: Clinical Calorimetry, Sixteenth Paper, The Basal Metabolism of Patients with Cardiac and Renal Disease, Arch. Int. Med., June, 1916, p. 980.

1. Stevens and Warren: Am. Jour. Pharm., 1907, lxxix, 518.
2. Pfaff: Jour. Exper. Med., 1897, ii, 188.
3. Syme and Acree: Am. Chem. Jour., 1906, xxxvi, 301.
4. McNair: Jour. Am. Chem. Soc., 1916, xxxviii, 1417.
5. The Nonprotein Nitrogenous Components of the Blood, editorial, THE JOURNAL A. M. A., June 3, 1916, p. 1781.
6. Folin, O., and Denis, W.: Jour. Biol. Chem., 1913, xiv, 29; 1914, xvii, 487.
7. Myers, V. C., and Fine, M. S.: The Post-Graduate, New York, 1914-1915.
8. McLean, F. C., and Selling, L.: Jour. Biol. Chem., 1914, xix, 31.
9. Taylor, A. E., and Hulton, F.: Jour. Biol. Chem., 1915, xxii, 63.
10. Greenwald, I.: Jour. Biol. Chem., 1915, xxi, 61.
11. Hohlweg, H.: Med. klin. Wchnschr., 1915, xi, 331.
12. Bang, I.: Biochem. Ztschr., 1915, lxxii, 101.
13. Gettler, A. O., and Baker, W.: Chemical and Physical Analysis of Blood in Thirty Normal Cases, Jour. Biol. Chem., 1916, xxv, 211.

initiation of the analysis by standard microchemical methods. No less than twenty-eight determinations were made on each sample, requiring in all only 70 c.c. of blood. The range of the results may be summarized briefly as follows: The values for nonprotein nitrogen tend toward a higher level (from 30 to 45 mg.) than those given by previous workers; the normal range of urea nitrogen should also be considered higher (from 15 to 25 mg.) than previously reported by many workers. Uric acid may reach as high as 3 mg. in 100 c.c. of blood in many normal individuals, and surprisingly low figures were consistently obtained for creatinin (0.1 mg. or less in 100 c.c. of blood). According to Gettler and Baker, any value for creatinin above 1 mg. should be considered as possibly indicating a pathologic condition. In this respect they propose to establish a standard somewhat lower than that suggested by their predecessors.[14] With respect to the normal content of sugar in the blood, the values obtained range between 50 and 120 mg. per hundred c.c. of blood — figures in general accord with those recorded by the majority of many recent investigators of this physiologic constant.

THE PROTEIN OF MUSCLE

Every physiologic chemist realizes the difficulties which at the present time attend the estimation of proteins in biologic tissues and products. The quantitative statements in regard to this important group of proximate principles everywhere distributed in living matter are most frequently based on indirect determinations — on calculations made on the basis of estimations of nitrogen or in some similar way. For example, the nitrogen content of a product is ascertained by some convenient method, such as the Kjeldahl procedure, and by the use of a factor (usually N × 6.25) the corresponding yield of protein is approximated. This is the way in which the composition of muscle tissue is ordinarily ascertained. Animal muscle, however, contains other nitrogenous compounds besides proteins. They are included among the so-called extractives of meat and represented by creatin, purin derivatives, etc. Inasmuch as meat furnishes some of the most important items in the dietary of man and represents the foremost source of animal protein for most persons, the desirability of having accurate facts regarding the protein content of muscular tissues is apparent. This is further accentuated by a growing recognition of the fact that protein and nonprotein nitrogenous compounds have an unlike significance in nutrition, so that the metabolism of each group demands separate consideration. The perfection of an improved method of estimating the substances here referred to in muscle[15] has enabled Janney to revise our standards of the composition of muscle, in the interest of greater accuracy. His newer work[16] shows that the amount of protein as calculated in the conventional ways for the more familiar types of muscle exceeds that determined by actual analysis by about 15 to 20 per cent. in nearly all cases. According to Janney the following figures represent average corrected values for muscle proteins: chicken, 16.6 per cent.; fish (halibut), 16.5; ox, 16.6; rabbit, 16.3; cat, 17.8; dog, 17.4; man, 16.4; whereas heretofore the published figures (N × 6.25) ranged from 18 to 21 per cent. The data bring out the interesting fact that the actual protein content of muscle usually is quite constant for the various species. Janney asserts that in wasting diseases among human beings, values as low as 12 per cent. are obtained, so that, according to his view, in such muscular disorders as myasthenia gravis the amount of protein muscle substance present might be found to bear a definite relation to the specific muscular seat of the disease.

14. Folin, O., and Denis, W.: Jour. Biol. Chem., 1913, xiv, 29; 1914, xvii, 487. Myers, V. C., and Fine, M. S.: The Post-Graduate, New York, 1914-1915.
15. Janney, N. W.: The Quantitative Determination of the Total Protein and Non-Protein Substances of Muscle — Improved Technic, Jour. Biol. Chem., 1916, xxv, 177.
16. Janney, N. W.: The Protein Content of Muscle, Jour. Biol. Chem., 1916, xxv, 185.

POISON LAWS AND ORDINANCES

Reprint 330,[1] just issued by the United States Public Health Service, is a digest of laws and regulations relating to poisons and habit-forming drugs enacted during 1914 and 1915. It is the third supplement to Public Health Bulletin 56,[2] issued November, 1912, in which were presented all the federal, state and municipal laws and regulations on poisons and habit-forming drugs then in force. The other supplements, reprints 146[3] and 240,[4] completed the compilation and brought the material up to the dates of publication. The third supplement follows the plan of arrangement and classification established in Public Health Bulletin 56 and the two preceding supplements, the four pamphlets forming a complete and uniform compilation of laws and regulations on this subject. Increasing attention on the part of legislators is being given to the regulation of poisons and habit-forming drugs. Lack of uniformity in the various state laws, and lack of a standard definition of a poison are two of the most serious defects at present. The enactment of the Harrison Narcotic Law, while it has led to the amendment of several state laws, has "in some instances at least increased rather than diminished the problems involved," in the opinion of the author, Martin I. Wilbert. As a practical result of the enactment of the Harrison law, those familiar with wholesale trade conditions assert that the sales of the proscribed drugs have been reduced fully 50 per cent. Wilbert thinks that the elimination of the guaranty clause in medicine labels, under the national Food and Drugs Act, will remove a potent possibility for misleading the public. Laws regulating occupational intoxications were enacted during 1914 and 1915 in two states, while laws restricting the use of wood alcohol are increasing in number and comprehensiveness. Eight states enacted laws prohibiting the manufacture and sale of alcoholic liquors. The laws regulating pharmacy have been amended in eleven states, while four states have

1. Reprint 330, a supplement to Public Health Bulletin 56, U. S. P. H. S., 1916.
2. Digest of Laws and Regulations . . . Relating to . . . Poisons and Habit-Forming Drugs, Pub. Health Bull. 56, U. S. P. H. S., 1912.
3. Reprint 146, a supplement to Public Health Bulletin 56, 1913.
4. Reprint 240, a supplement to Public Health Bulletin 56, 1915.

legally adopted the Pharmacopeia and National Formulary as standards. Naturally, such a compilation is largely a record of details which it is impossible to enumerate. This pamphlet and the two preceding supplements, with the original bulletin, form a complete collection of laws and ordinances on poisons and habit-forming drugs with comments, tables and much additional illuminating material.

CHEMOTHERAPEUTIC TREATMENT OF TUBERCULOSIS

The newspapers on Wednesday morning of this week announced again the discovery of a specific treatment for tuberculosis and leprosy. This announcement was based on the fact that the current issue (August) of the *Journal of Experimental Medicine* is devoted wholly to reports of work by Japanese investigators, Koga, Otani and Takano, on this subject. Since Ehrlich's and Hata's discovery that a chemical combination might be of particular value in the treatment of syphilis, various investigators have attempted to apply chemotherapy to tuberculosis. Some evidence is available to indicate that copper and cyanid exert a special influence on the tubercle bacillus. Briefly, Koga found that the treatment of animals inoculated with tuberculosis with a preparation of copper and potassium cyanid produces, after repeated injections, healing changes in tuberculous lesions. The extent of the healing, however, has not been determined. Emulsions were made of lungs, liver, spleen and other organs of some of the animals, apparently healed, and injected into the abdominal cavity of guinea-pigs. Some of the guinea-pigs receiving the emulsion developed tuberculosis, and further studies are being made. Koga's experimental report is supplemented by a clinical report on sixty-three treated human cases, including the various stages of tuberculosis. He believes, from his results, that the preparation, which has been named "cyanocuprol," greatly improves, or apparently cures, pulmonary tuberculosis in the first and second stages, and that it seems also to produce beneficial effects on the disease in the third stage. Otani reports the results of treatment in eighteen cases of tuberculosis. He considers "cyanocuprol" remarkably effective, and states that it may be more generally used than tuberculin. He also defines the indications and the various conditions governing the use of the preparation. Takano used the "cyanocuprol" in six cases of leprosy with what appeared to be beneficial effects. There is an element of secrecy connected with the preparation itself: Koga states that it is a double salt of copper and potassium cyanid diluted 1:2,000 and treated "with a specific manipulation in order to prevent the formation of free hydrogen cyanid and the subsequent chemical changes into potassium and ammonium formate, which process is accelerated by heating." No statement is made as to what this "specific manipulation" is or consists of; at the same time Koga insists that unless this manipulation is carried out, the injection of the double salt of copper and potassium cyanid is not safe for human beings. Further, nothing definite is said as to the proportions in which the various elements in the preparation are combined. On the whole, however, these reports appear to be a scientific statement of the results of experiments by enthusiastic, yet at the same time conservative, investigators. It will be interesting to watch the progress of what appears to be a scientific attempt to do for tuberculosis what salvarsan has done for syphilis.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Personal.—Dr. Lloyd Noland, Birmingham, superintendent of the department of health of the Tennessee Coal, Iron and Railroad Company, sailed from New York for Europe, July 8. Dr. Noland will do medical research work and study in the war hospitals of France.——Dr. William T. Cocke has been appointed health officer of Demopolis, succeeding Dr. Thomas C. Savage, M. R. C., U. S. Army, who has been ordered to Fort Sam Houston, Texas.

Typhoid Fever.—Since June 1, between 500 and 600 cases of typhoid have been officially recorded in the Birmingham district, and with the unreported cases, of which undoubtedly many exist, the number of cases in the district will be near 700. In the city alone 350 cases were reported during the first twenty-five days of July, with twenty-five deaths. The epidemic has, it is believed, been definitely checked.—— Surg. Leslie L. Lumsden, U. S. P. H. S., who was called to Birmingham to investigate the situation, stated in his report that the cause of the recent outbreak was ice cream manufactured by a single manufacturer. Of 300 cases examined, 163 patients had eaten ice cream manufactured only by this manufacturer. A city wide clean-up campaign is being undertaken in Birmingham.

ILLINOIS

Red Cross Hospital at Springfield.—The Red Cross membership campaign committee at Springfield announces, as a result of the recent campaign, a membership of 1,200 in the local chapter.

Ambulance Corps Being Formed.—A meeting was held in Springfield, July 20, at the offices of Dr. Jay T. Wood, to form an ambulance company of Springfield physicians which will offer its services to the Illinois National Guard.

Personal.—Dr. Jesse G. Maxon, Harvard, who has been on duty at the mobilization camp at Springfield, has been ordered to duty as a member of the Medical Reserve Corps, at Fort Sam Houston, San Antonio, Texas.——Dr. Cora J. Kipp, Mineral, who is the head of the Methodist Hospital at Brindaban, India, is on furlough in this country and will return to India in January.——Dr. George P. Gill, Rockford, spoke before the Elks Club of Freeport, July 18, on "Experiences of the European War."——Dr. William J. Uppendahl, Peoria, who has been serving with the allies in a field hospital for the past year, has returned to the United States.

Conference of Charities and Correction.—The twenty-first annual state conference of charities and correction will be held in Alton, October 20 to 22, and in connection with this conference the Illinois Association for the Prevention of Tuberculosis, the State Association of County Home Superintendents, and the State Probation Officers' Association will meet. The general meeting on the first evening will be under the auspices of the Committee on Mental and Physical Efficiency. The same subject will also be considered at the Saturday morning session; on Saturday afternoon, "Probation and Prevention of Crime" and "Labor and Compensation" will be the subjects for discussion; on Saturday evening there will be a mass meeting at which "Probation and Prevention of Crime" will be considered; Sunday afternoon there will be a mass meeting on "Labor and Compensation," and the conference will close Sunday evening with a program on "Child Hygiene."

Chicago

Hospital Purchases Property.—The Augustana Hospital has purchased property at Garfield Avenue and Sedgwick

Street, 379 by 267 feet. It is proposed to erect a hospital building to cost from $200,000 to $300,000 on the site.

Transfer of County Institutions to State.—The act of the state in assuming charge of the Cook County Hospital for the Insane, Dunning, giving it the title of the Chicago State Hospital, is believed to have set the precedent for the transfer of the Cook County Detention Hospital and Psychopathic Institute to state control. A committee of the board of administration met with the Cook County board in Chicago, July 26, to consider ways and means of the transfer.

INDIANA

Society Transfers Hospital to City.—The Kendallville Medical Society has turned the Lakeside Hospital over to the people of Kendallville as a public institution. The property includes the hospital building, a second house which will be used as a maternity, and 3 acres of land.

Red Cross Organization Formed.—At a meeting of the charter members of the Indianapolis Red Cross, July 19, held in the Chamber of Commerce, directors were elected and the organization was perfected. Drs. Alois B. Graham, James H. Taylor and Herman G. Morgan are ex-officio directors of the organization, and Dr. Frank B. Wynn was elected a member of the board of directors.

Water Examinations.—H. E. Barnard, Indianapolis, state food and drug commissioner, states that water samples are coming in for examination by the state board of health at the rate of twenty-five a day. It has been found that about 60 per cent. of the well water sent in is polluted. Water from city supply sources is not found to be polluted so frequently. Samples of ice are also being sent in. In most cases the ice is found to be all right. These samples are sent in by health officers and citizens.

New Medical School Building.—Trustees of the University of Indiana have recommended that a new medical school building, power house, laundry, and nurses' home be erected on the grounds of the Robert W. Long Hospital, Indianapolis. A committee was appointed, including the president of the university, Drs. Samuel Smith, Richmond; Charles P. Emerson, John H. Oliver, and Frank F. Hutchins, Indianapolis, to formulate plans for the proposed building and report as soon as possible to the board.

Cornerstone Laid.—The cornerstone of the new Marion County Tuberculosis Sanatorium near Oaklandon was laid with appropriate ceremonies, July 22, by Dr. John N. Hurty, secretary of the state board of health, and Dr. George Thomas Palmer, Springfield, Ill., delivered the principal address. After the exercises, a visit was paid to Cherryvale, the fresh air farm of the Indianapolis *News*.——Drs. Alfred Henry and John A. MacDonald have been appointed members of the board of managers for the institution, the appointment to take effect November 1.

Medico-Military Assignments.—The officers of the Medical Corps, Indiana National Guard, have been assigned and reassigned as follows: Maj. Larue D. Carter, Indianapolis, commanding officer, Field Hospital, Company No. 1; Capt. John W. A. Emhardt, Indianapolis; First Lieut. Simon Reisler, Indianapolis; First Lieut. Harold W. Nimal, Indianapolis; First Lieut. Clint. C. Sourwine, Brazil; Capt. Archibald G. Chittick, Frankfort, commanding officer, Ambulance Co. No. 1; Capt. James W. Hadley, Frankfort; First Lieut. Arett C. Arnett, LaFayette; First Lieut. Donald C. McClelland, LaFayette; First Lieut. Cecil E. Johnson, Rensselaer; Maj. Frank B. Humphreys, Angola, commanding, Regimental Infirmary, Third Infantry; Capt. George W. Twomey, New Albany; First Lieut. Leonard J. Ostrowski, Indiana Harbor; First Lieut. Butron A. Thompson, Kokomo; Maj. Earle S. Green, Muncie, commanding, Regimental Infirmary, Second Infantry; Capt. Geo. F. Holland, Bloomington; First Lieut. Edwin G. Kyte, Seymour; First Lieut. Mitchell O. De Vaney, Indianapolis; Maj. Frank W. Foxworthy, Indianapolis, commanding, Regimental Infirmary, First Provisional Regiment; Capt. N. Austin Cary, Crawfordsville; First Lieut. Renos H. Richards, Patricksburg; First Lieut. Leonard P. Collins, Winamac; Capt. Frank C. Robinson, Martinsville, Artillery Battalion.

KENTUCKY

Date of State Society Meeting Changed.—The date for the annual meeting of the Kentucky State Medical Association in Hopkinsville has been changed from September to October 17-20.

Smallpox at Fort Thomas.—A case of smallpox appeared among the National Guard at the mobilization camp at Fort Thomas, July 18. The patient was a member of Company F, Second Infantry, Jackson. The reservation was closed and all contacts were placed under surveillance and vaccinated.

Personal.—Dr. William Hall Hawkins has resigned as city physician of Lexington and will locate in New York.——Dr. Wallis W. Durham, Crofton, has been appointed second assistant physician of the Western State Hospital for the Insane, Hopkinsville, succeeding Dr. Roy F. Robinson, Hopkinsville, resigned.——Dr. Ben L. Bruner has been elected temporary chairman of the Optimists Club of Louisville.

Twelve Counties Join for Sanatorium.—Representatives of the fiscal courts of Boone, Campbell, Carroll, Kenton, Bracken, Pendleton, Gallatin, Grant, Harrison, Mason, Owen and Robertson counties, comprising the Seventh Tuberculosis District, met in Covington, July 23, and considered the erection of a tuberculosis sanatorium on the hills between Covington and Newport. The sanatorium will be designed to accommodate 350 patients.

MARYLAND

Personal.—Dr. J. Clement Clark has been reelected superintendent of the Springfield State Hospital for the Insane, Sykesville.——Dr. Stewart V. Irwin, Baltimore, returned to America, July 11, after a partially successful attempt to inspect prison camps in Germany.

Baltimore Roentgenologists Dine.—The recently organized Baltimore Roentgenological Society, of which Dr. Frederick H. Baetjer is president and Dr. Henry J. Walton, secretary, held its first annual dinner at the Baltimore Country Club, June 23. Capt. Arthur C. Christie, M. C., U. S. Army, and Drs. Thomas A. Groover, John H. Selby and Harry E. Simons of Washington, D. C., were the out-of-town guests.

On Guard Against Paralysis.—The health department is conducting a house-to-house inspection of the section about South Bond and Thames Streets, from which the latest case of infantile paralysis was reported. The decision to make this careful examination of conditions in that neighborhood followed an inspection by several of the city officials. The neighborhood is in the heart of the foreign quarter of the city and the sanitary conditions leave much to be desired. The inspection will be for the purpose of impressing on the people the importance of taking precautions against an outbreak of infantile paralysis.

NEW YORK

State to Open Laboratories.—It was announced at the state health department, on July 23, that three temporary state laboratories will be established immediately to aid in the fight against infantile paralysis. Two of these laboratories will be on Long Island and the other probably at Kingston.

Clinic Endowed.—Announcement is made that the Psychopathic Clinic for Mentally Deranged and Feebleminded Persons at the State Prison, Sing Sing, has received an endowment of $10,000 from John D. Rockefeller. The clinic was opened August 3, and the advisory board is composed of Drs. Terry M. Townsend, George S. Burns and William Seaman Bainbridge.

New York City

Personal.—Dr. Timothy D. Lehane, while performing a necropsy on a stowaway who died of a tropical fever, suffered a wound of the arm which has become infected and may result in loss of the arm.——Dr. Carl F. A. Eggers, who has spent almost two years working in German military hospitals, has returned to this city for a short vacation, after which he will again return to Germany.

Brooklyn Disposes of Stray Cats.—As a part of the clean-up connected with the epidemic of infantile paralysis, about 50,000 cats have been caught and killed by the Brooklyn police since the epidemic began. Practically no cats are seen in the streets except about the water fronts, where the residents have objected to parting with cats, fearing that the rats from incoming vessels may be more dangerous than the cats.

Psychologic Laboratory Established.—A psychologic laboratory has recently been established at Bellevue Hospital, New York, under the direction of Dr. Menas S. Gregory, chief of the psychopathic and alcoholic services. Facilities will be provided for both clinical and research work. As these services admit about 15,000 patients annually, the opportunities for research will be exceptional. Dr. Leta S. Hollingworth, formerly psychologist in the Department of Public Charities in New York, has been placed in charge of the laboratory.

Convalescent Hospital Opened.—Directors of the Neustadeter Foundation, established by Mrs. Henry Neustadeter, announced, July 20, that a temporary convalescent hospital for the care of infantile paralysis patients, to be known as the Neustadeter Home, would be opened by the foundation. The home will be equipped with the most modern devices and will accommodate fifty patients, for whom treatment will be provided from eight to ten months. Dr. Sigismund S. Goldwater, formerly health commissioner, is a member of the board of directors of the institution.

A Conference on Infantile Paralysis.—Health Commissioner Dr. Haven Emerson has announced that a conference of pathologists and workers in experimental medicine will be held in the faculty rooms of the College of Physicians and Surgeons of Columbia University, commencing August 3. Among those from a distance invited to attend are the following: Drs. Victor C. Vaughan, Ann Arbor, Mich.; Milton J. Rosenau, Boston; James W. Jobling, Nashville, Tenn.; Paul A. Lewis, Philadelphia; William H. Welch, Baltimore; Ludvig Hektoen, Chicago; Charles C. Bass, New Orleans; Theobald Smith, Princeton, N. J.; John F. Anderson, New Brunswick, N. J.; Richard M. Pearce, Jr., Philadelphia; Francis W. Peabody, Boston, and John G. Adami, Montreal, Que. Reports to July 28 show that there have been 3,562 cases of infantile paralysis in this city, with 744 deaths. It has been observed that the age incidence of the disease has advanced with the progress of the epidemic. Of twenty-one Brooklyn patients listed according to ages by the end of last May none was more than 5 years of age. Of 1,108 Brooklyn patients similarly listed by July 28, 142, or 12.8 per cent., were more than 5 years of age and about 3 per cent. were more than 10 years of age.

NORTH CAROLINA

Sanatorium Opened.—The Anson County Sanatorium, Wadesboro, was formally opened, July 5. In the morning clinics were held; after luncheon there was a short scientific session at which papers were presented and discussed, and in the evening a general reception was given to the physicians and the public, together with a linen showed for the benefit of the institution.

Personal.—Dr. James A. Speight, Nashville, Tenn., has succeeded Dr. James C. Braswell, Jr., as whole time health officer of Nash County. Dr. Braswell has accepted the position of health officer for the city of Rocky Mount.——Dr. Joseph J. Kinyoun, Washington, D. C., a native of the state, but for many years past one of the ablest of the physicians in the U. S. Public Health Service, has returned to North Carolina and assumed the duties of city health officer of Winston-Salem.

OKLAHOMA

Hospital Opened.—The City and County Hospital, Hobart, was opened for the reception of patients, June 21.

New Board Officers.—At the annual meeting of the State Board of Medical Examiners, held in Oklahoma City, July 12, Dr. W. Le Roy Bonnell, Chickasha, was elected president; Dr. B. L. Denison, Garvin, vice president, and Dr. Ralph V. Smith, Tulsa, secretary.

Personal.—Dr. Amos Avery has been appointed city physician of Sapulpa.——Dr. Timothy J. Butler, M. R. C., U. S. Army, Weatherford, has been ordered to report for duty at Fort Sam Houston, Texas.——Dr. John A. Brooke, Oklahoma City, has moved to Philadelphia.

Health Education.—Householders of Tulsa have been supplied with a free booklet dealing with modern sanitation and municipal health requirements. In this pamphlet are considered various problems of milk supply, garbage disposition, the menace of the fly and kindred subjects.

PENNSYLVANIA

Personal.—Dr. Clyde Hazlett, Pittsburgh, who has been on duty in Persia with the Russian Red Cross, is reported to be ill with typhus fever at Khoi, Northwest Persia. Dr. Hazlett is being cared for by Dr. Edward S. Dickey, also of Pittsburgh, and also on duty with the Russian Red Cross.

Infantile Paralysis Increases.—Two new cases were reported in Philadelphia, July 27, and since the epidemic began one death has occurred. The total number of new cases reported throughout the state, July 27, was seven and since the epidemic began about July 1, seventy-six cases have been reported to the health department.

Increased Entrance Requirement.—An official communication just received from Jefferson Medical College states that the premedical class has been abandoned and that beginning with the session of 1917-1918 all matriculants will be required to present credentials showing the completion of two years of college work, including courses in physics, chemistry and biology, with laboratory work, and a modern language, either French or German.

Philadelphia

More Nurses for Health Stations.—Eight more nurses have been appointed with the new health center established and others are to be started. It is planned to increase the number to twenty-two nurses. This action was recently taken by councils. The salary paid nurses in this work is $900 a year.

Personal.—Dr. Enrique Sepulveda of Valparaiso, Chile, has visited this city and purchased hospital equipment for St. John's Hospital, Valparaiso. Dr. Sepulveda is chief of the eye, ear, nose and throat clinic of that institution.——Dr. Edward A. Treacy has been appointed assistant in gynecology in St. Joseph's Hospital.

Ban on Public Drinking Cups.—A ban will be placed on the public drinking cups in Fairmount Park, according to the department of health and charities. Dr. Wilmer Krusen will enforce the law which prohibits the use of public drinking cups in this state. It is said the park commission will act in accordance with the law.

Pauper Patients to Have Summer Clothes.—Through arrangements completed July 25, the director of the department of health and charities has arranged to supply the pauper inmates of Blockley with real summer clothing. One thousand two-piece suits have been ordered for the inmates. Heretofore these people were compelled to get along as best they could with whatever clothing they had. Heavy clothing was frequently worn throughout the entire summer.

Babies' Health Centers.—Following the plan of the municipal authorities in establishing health centers in congested parts of the city, private organizations, as mentioned in THE JOURNAL last week, have taken up that character of work in the campaign to reduce the mortality. The Babies' Hospital established a branch system at Ninth and Pine Streets. Mothers and their children will be given medical care, and arrangements will be made for them to sleep on roof gardens. About $50,000 has been subscribed for the project. Another new health center has been opened at 1136 North Second Street. A physician and a corps of nurses are in attendance. Three additional centers will be opened at points in South Philadelphia.

WASHINGTON

Personal.—Dr. Benjamin S. Cerswell, Toppenish, has been appointed full time health officer of North Yakima, succeeding Dr. Thomas Tetreau, resigned to become city health officer of Portland, Me.——Dr. William B. Abbott, Sunnyside, has been appointed deputy health officer of North Yakima.

Medical Postgraduate Course.—One hundred and one physicians of the state have registered for the first medical postgraduate course offered by the University of Washington extension division, Seattle. The lectures in the course are being given in the council chamber of the city hall, and are given by Dr. Charles L. Mix, Chicago, who also will give clinical courses at the various hospitals of the city.

Sanitary District for State.—At the closing session of the Association of State, County and City Health Officers at Seattle, July 11, the organization unanimously approved the draft of the bill to create fifteen sanitary districts in the state with a full time health officer in charge of each district. This legislation will do away with the part time health officers and will substitute full time men trained in public health work and who will receive a salary of not less than $2,000 or more than $3,000.

State Association Meeting.—The Washington State Medical Association held its twenty-seventh annual meeting in Seattle, July 12 to 14, under the presidency of Dr. John R. Brown, Tacoma. The following officers were elected: president-elect, Dr. George M. Horton, Seattle; president, Dr. John M. Semple, Spokane; vice presidents, Drs. Charles S. Wilson, Tacoma, and Herman P. Marshall, Spokane; secretary-treasurer, Dr. Curtis H. Thompson, Seattle (reelected), and assistant secretary-treasurer, Dr. John H. O'Shea, Spokane; trustees for the first district, Drs. Wilbur N. Hunt, Burlington; Luther M. Sims, Kalama; Richard J. O'Shea, Seattle; Horace J. Whitacre, Tacoma; trustees for the second district,

Drs. Cornelius J. Lynch, North Yakima; Henry H. McCarthy, Spokane; Frederick Epplen, Spokane, and Frank E. Culp, Wenatchee; general trustees, Drs. Wilson R. Johnston, Spokane; Edwin W. Janes, Tacoma, and Peter D. McCornack, Spokane; delegates to the American Medical Association, Drs. Don H. Palmer, Seattle, and Donald E. McGillivray, Port Angeles, and alternates, Drs. Charles F. Eikenbary, Spokane, and Edward A. Rich, Tacoma. The next meeting will be held in Spokane in 1917. At the annual banquet Dr. Philip V. von Phul, Seattle, presided as toastmaster, and a silver loving cup was presented to Dr. Curtis H. Thomson, for the past eight years secretary-treasurer of the association.

CANADA

Association Meeting.—The Canadian Public Health Association, The Canadian Association for the Prevention of Tuberculosis, and the Sanitary Services of the Province of Quebec will meet in Quebec City, Sept. 13 and 14, 1916.

Summer Course at Queen's.—The summer session of Queen's Medical College, Kingston, which is being held on account of the need for doctors at the front, will close for two weeks on July 29. The summer session has been a very successful one, and there are over 100 students who have taken advantage of it to complete their course.

Personal.—Dr. Ephraim E. Kells, Regina, Sask., is in Chicago taking graduate work.——Dr. J. W. H. Huykman, Jansen, Sask., a graduate of the University of Amsterdam, has commenced practice in Balgonie, Sask.——Dr. Warren A. Dakin has returned from active service and resumed his duties as medical superintendent of the Regina, Sask., General Hospital.——Dr. Charles E. Tran, Kamsack, Sask., has enlisted for overseas service.——Dr. Arthur W. Tanner, Moosomin, Sask., was recently killed in action while on active service at the front.

Colonel Primrose Returns.—Lieut.-Col. Alexander Primrose, chief surgeon with the University of Toronto Base Hospital, which has been stationed at Saloniki, has returned to Toronto on short furlough. The hospital was capable of housing 1,040 patients, but in the early days of its location in Greece, 1,500 was generally its full complement. The hospital was recently moved to a new site and is now housed in huts, having been all winter in tents. Splendid and efficient service has been done by this hospital unit, which is under the command of Brigadier-General James A. Roberts, Toronto.

Infantile Paralysis in Ontario.—Maj. John W. S. McCullough, Toronto, chief medical officer of health for Ontario, and Capt. John G. Fitzgerald, Toronto, of the provincial board of health, have visited Windsor, Ont., where there have been reported several cases of infantile paralysis, and in conjunction with Dr. George R. Cruickshank, Windsor, the medical officer of health, have taken the situation in hand. Dr. Fitzgerald is to proceed to New York and Boston to study means for the prevention of the disease. Although the medical officer of health of Toronto denies there are any cases in that city, there are said to be two or three cases in the immediate suburbs.

GENERAL

Military Surgeons Meeting Postponed.—On account of the military activities on the Southern border, the meeting of the Association of Military Surgeons of the United States, which was to have been held at the Hotel Sherman, Chicago, October 2 to 4, has been postponed indefinitely.

Appropriation for Medical Department.—The secretary of war has submitted a supplemental estimate of appropriation of $7,000,000 required for the service of the fiscal year, 1917, by the medical and hospital department for the medical needs of an active military force of 400,000 men, in addition to amounts heretofore estimated for such purpose.

Meeting of the American Association for the Study and Prevention of Infant Mortality.—The official program for the annual meeting of this association, which takes place October 19-21, in Milwaukee, has just appeared. Special sessions are announced devoted to obstetrics, propaganda, pediatrics, governmental activities, public school education and rural communities.

Women Doctors in War.—At a recent meeting in Boston to organize a unit of women doctors for service in case of war, Med. Insp. Norman J. Blackwood, U. S. Navy, urged the necessity of organization in advance. When war comes, the places of the men will have to be filled by the women. Women might learn how drugs are made. Professional women could organize classes for instruction in first aid, diet for the sick, join the Red Cross, learn of its various activities and find out what they are best fitted to do. What Americans need, in the way of preparedness, said Dr. Blackwood, is discipline which will engender a finer sense of patriotism.

Medical Reserve Officers Interrogated as to Availability for Service.—Officers of the Medical Reserve Corps, inactive list, have received a circular in which inquiry is made as to their readiness for service. Each officer is asked to state whether or not he is a member of the National Guard; whether he would prefer service in the Southern department; whether he would prefer service in the Philippine Islands, Canal Zone, Hawaii, Alaska, etc., and how soon after notification he could report. It is presumed that the intention is to recall regular army officers from the foreign posts mentioned as needed, and to replace them with the medical reserve officers who indicate their willingness to accept such service.

Increase of Army Medical Corps.—On the basis of 130,000 men in the army under the new law, there will be 910 commissioned medical officers, which would include twenty-eight colonels, fifty lieutenant colonels, 225 majors and 607 captains and first lieutenants. On the basis of 100,000 men there would be about 250 vacancies in the junior grade. There is always a difficulty in obtaining qualified candidates under the existing age limitation of 30 years (which really means 29, when the term at the Army Medical School is taken into account), as medical students are now being graduated later in life. The proposed amendment to the existing law making the maximum age 32 instead of 30 may afford a possible relief, and render it possible to fill the corps with acceptable mature men.

Infantile Paralysis.—Five more public health service surgeons have been ordered to New York to aid in the campaign to prevent spreading of the infantile paralysis epidemic. Twenty of the experts of the service are already there. Those now ordered out are Surgeon William J. Pettus, Charleston, S. C.; Surgeon Henry W. Wickes, Detroit; Surgeon Dana E. Robinson, Ellis Island (on leave); Past Assistant Surgeon R. A. Herring, Louisville, Ky., and Senior Surgeon Parker C. Kalloch, Portland, Me. All leave of absence has been cancelled by the service, it is said, on account of the imperative demand for surgeons. Assistant Surgeon-General William C. Rucker states that while the local authorities in New York seemed to have the situation pretty well in hand, the fight to prevent the disease from spreading to other parts of the country was just beginning.

Fraudulent Infantile Paralysis Cures.—Officials of the Department of Agriculture, charged with the enforcement of the Food and Drugs Act, have issued special instructions to inspectors to be particularly alert for interstate shipments or importations of medicines, the makers of which allege cure or alleviation of infantile paralysis. In times past, it has been known that whenever a serious epidemic exists, unscrupulous dealers prey on the fear and ignorance of the public by flooding the market with worthless preparations for which they claim curative properties. The Department of Agriculture warns that the Federal Food and Drugs Act applies only to products which are shipped from one state to another or offered for import or export, and that products which are made and consumed wholly within a single state are subject only to state laws. Persons, therefore, buying or using a so-called remedy made in their own state must rely on the protection accorded them by their local health authorities.

Congressional Notes.—The following bill was introduced in the Senate by Mr. Shafroth, July 7:

A Bill to adopt the weights and measures of the metric system as the standard weights and measures in the United States.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that on and after the first day of January, 1918, all the departments of the government of the United States, in the transaction of all business requiring the use of weight and measurement, except in completing the survey of public lands, shall employ and use only the weights and measures of the metric system; and on and after the first day of January, 1920, the weights and measures of the metric system shall be the legal standard weights and measures of and in the United States.

The bill was referred to the committee on standards, weights and measures.——The following joint resolution was introduced in the House of Representatives, July 11, 1916, by Mr. Siegel:

Joint resolution authorizing the president of the United States to pay $100,000 and to present a gold medal suitably engraved to the discoverer of a specific preventive or remedy for infantile paralysis.

Whereas, The spread of infantile paralysis has at various times seriously endangered the health of the people of the United States; and

WHEREAS, It is freely admitted by the most eminent physicians of the United States that they do not know the cause thereof or the proper method of eradicating or preventing same; and

WHEREAS, It is to the best interests of the welfare and health of the people of the United States that a specific preventive or remedy for infantile paralysis be found; therefore be it

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the president of the United States be, and he is hereby, authorized to pay $100,000 and to present a gold medal suitably engraved to the discoverer of a specific preventive or remedy for infantile paralysis, and the money for making said payment and the cost of said gold medal are hereby appropriated out of any money in the treasury not otherwise appropriated.

The resolution was referred to the committee on appropriations.

The Gary System.—The general education board announces that it is about to complete a study of the public school system inaugurated at Gary, Ind., that a full and authoritative account of this interesting experiment in public education may be available for study and use throughout the country. The board has a staff of educational experts who have already devoted five months to a first hand study of the purposes, methods and costs of the system at Gary and the results actually achieved there. The investigation has been under the charge of Abraham Flexner of the board, assisted by Frank P. Bachman, formerly associate superintendent of schools in Cleveland. The specialists who have dealt with particular fields are: Prof. C. R. Richards, director of Cooper Union, vocational and industrial instruction; Mrs. Eva W. White, director of the extended use of public schools of Boston, domestic science and arts; Prof. George D. Strayer, Teachers' College, Columbia University, administration, organization and supervision; S. A. Courtis, director research in the schools of Detroit, classroom testing; Lee K. Hanmer, director of the department of recreation and playgrounds of the Russell Sage Foundation, physical training and recreation; Prof. Otis W. Caldwell, University of Chicago, science; Frank L. Shaw, recently with the Cleveland School Survey, statistical work; Ralph Bowman, formerly of the bureau of municipal research, cost accounting. In addition the board has made an appropriation to Prof. Guy M. Whipple of the University of Illinois for a systematic and thorough study of the talented child. The board has also authorized a study of the junior high school, which includes the seventh and eighth grades of grammar school and the first year of high school. This study will be made by Prof. Thomas H. Briggs of the Teachers' College, Columbia University.

FOREIGN

Deaths Abroad.—Sir James Frederick Goodhart, Bart., M.D., LL.D., Aberdeen; F.R.C.P., London; aged 70; consulting physician to Guy's Hospital and Evelina Hospital for Children, London; died at his home in Portland Place, May 28. Sir James was an authority on diseases of children; Bradshaw lecturer at the Royal College of Physicians in 1885, on "Morbid Arterial Tension," and Harveian orator in 1912, when his subject was "Common Neuroses," and narrated the triumphs of pathology for the past forty years.

Ten Thousand Dollar Prize for Best Mechanical Substitute for the Hand.—An anonymous donor has offered a prize of $10,000 (50,000 francs) to be handed over to the maker of the mechanical apparatus best supplying the place of the hand. All competitors must belong to allied or neutral nations. They are to demonstrate before the French Surgical Association mutilated men who have been using their apparatus for at least six months. The surgical association will experiment with each apparatus on mutilated men for the length of time it thinks fit. The apparatus rewarded is to remain the property of its inventor. The competition will be closed two years after the end of the war. Any person wishing to compete should write M. le Secrétaire Général de la Société Nationale de Chirurgie, 12, rue de Seine, Paris, France.

Headship of Peking Medical College.—The China Medical Board of the Rockefeller Foundation announces that the trustees of Union Medical College, Peking, have appointed Dr. Franklin Chambers McLean, New York, formerly of the Rockefeller Institute, professor of internal medicine, a position carrying with it the headship of the college. Dr. McLean is now on his way to the Orient, where he will study the work of the China Medical Board in Peking and Shanghai. After an inspection tour of about three months he will return to collect his staff and study the administration of the outpatient department of some large hospital in the United States. On his way to China, Dr. McLean will spend about a fortnight studying the hospitals and laboratories of Japan.

Death of Neisser.—The cable announces the death at Berlin of the discoverer of the gonococcus, Albert Neisser, professor of skin and venereal diseases at the University of Breslau. Ludwig Siegmund Albert Neisser was born at Breslau sixty-one years ago, studied there, and became assistant to Simon, professor of dermatology, and at his death in 1882 succeeded him in this chair and in the charge of the dermatologic clinic, to which he remained loyal to his death. His discovery of the gonococcus dates from 1879, and he was one of the first to insist on the tuberculous nature of lupus, but his publications embraced almost the entire field of dermatology and syphilology, and especially the revolution in treatment, in diagnosis and sociologic consequences which followed the discovery of the causal agent of gonorrhea. He was particularly active in studying the prophylaxis of venereal diseases in general and the prostitution question from the sociologic, national-economic and ethical standpoints. He attacked the question with new vigor after the war broke out; one of his latest articles on the subject was summarized in THE JOURNAL, March 4, 1916, p. 777. He was one of the publishers of the *Archiv für Dermatol. und Syphilis*, of the *Bibliotheca med.*, and was the founder and editor of the *Stereoskopisch-med. Atlas*. His father was a physician at Breslau before him and translated several American works into German, including G. M. Beard's "Neurasthenia."

Typhus in Mexico City.—The report from the Mexican national public health service for the month of March, just received, states that 1,936 new cases of typhus were recorded at Mexico City in the five weeks ending April 1. The isolation hospital at Tlalpam had had 2,182 cases by that date since December 26, and the mortality had been 16.88 per cent. among the 977 men, and 15.16 per cent. of the 1,205 women. Mexico City has a force of 270 to fight the epidemic; seventy-three do house-to-house visiting; twenty-seven watch over the theaters and movies; eleven over the churches; sixteen have charge of special disinfections, and forty watch over the street cars, to keep notoriously dirty persons from boarding the cars. During the month, over 15,000 were thus kept out of the cars. The presence of the agents on all the tram lines was utilized further for enforcement of the antispitting ordinances. Twenty-four of the agents have the task of convoying the "notoriously dirty" to the disinfecting baths. During the month the hair of 17,529 persons was cut, 5,523 had their beards shaved and 263 had their heads shaved. Disinfecting baths were given to a total of 57,783, and 89,148 garments were disinfected. Eleven agents, with an additional fifty on Sundays, guarded the eighty-two churches against the entrance of the dirty (733), the sick (141), beggars (154), and persons carrying lunch (1,022). Of the forty-six places of amusement, thirty-eight were disinfected and 4,111 notoriously dirty persons were refused admissions. Overcrowding was also guarded against. Over 400 houses were disinfected, 530 rooms, and unlousing was done on 807 individuals. Two of the "agents" succumbed to typhus within two months. In the house-to-house visiting, 511 sick persons were found, seventy-eight of whom had typhus. Flying brigades were also organized and sent through the poorer quarters of two neighboring towns. Circulars were distributed and placarded advising the public to report to the authorities every case of sickness, even simple fever, among their neighbors. The expense of these circulars was shared by the medical inspectors as there were no funds for that purpose. The total expense of the antityphus campaign for the month is said to have been $144,026.98. The chief of the national public health service is Dr. J. M. Rodriguez, but Dr. A. Pruneda is in charge of the typhus campaign.

WAR NOTES

Canadian Militia Needs More Doctors.—Through the director of medical service of the Canadian Militia Department, a call has been made for an unlimited number of surgeons to serve with the Canadian Army Medical Corps. The physicians must be British subjects, physically fit for active service, not more than 40 years of age and graduates in medicine from a Canadian university. All who are accepted will be given the rank of lieutenant in the Royal Army Medical Corps.

OUR TROOPS ON THE BORDER

Red Cross Hospital.—The American Red Cross has already equipped eight base hospitals of 500 beds each, and others which will altogether accommodate about 15,000 patients are in process of organization. About 6,000 Red Cross nurses are holding themselves in readiness to go when needed.

Red Cross Hospital Bases.—Plans for the enrollment of physicians of Philadelphia and for the establishment of free hospital bases in that city were discussed, July 14, at a joint conference of executive officers of the Southeastern Pennsylvania Chapter of the American Red Cross and representatives of the Philadelphia County Medical Society. Dr. Wilmer Krusen presided. Dr. Alfred Stengel advocated the appointment of recruiting committees in all the county medical societies, with a view to enrolling the local physicians as members of the Southeastern Pennsylvania Chapter. The three classes are: 1, those who volunteer to go wherever the government may choose to send them, including service in time of war and in foreign possessions; 2, those who volunteer to serve anywhere within the United States; and 3, those who volunteer to serve only within their own community. The value of an efficiently organized Red Cross in combating community epidemics was also mentioned.

Health and Sanitation.—Dr. Thomas Darlington, formerly health commissioner of New York, has been making an exhaustive study of camp conditions on our southern border on behalf of the Civic Federation. He reports that the camps at Fort Sam Houston, Brownsville, Laredo, Eagle Pass and Del Rio are well located and well managed. He commends the work of the medical corps of the army, and finds the food supply excellent in quantity and variety and has found no conditions that should produce disease. Dr. Eugene A. Crockett, Boston, special agent of the American Red Cross in El Paso, Tex., reports that he has thoroughly inspected the camps in the vicinity of El Paso, Columbus, N. M., and on the line of communication south as far as Colonia Dublan, Mexico. He finds the general condition of troops excellent; that the sanitation of camps at Columbus, Ojo Fredrico, and Colonia Dublan is as near perfect as is possible to attain; that the health of the troops is excellent, and that there are plenty of available beds in all hospitals except at Fort Bliss, where there has been an immense number of volunteer troops. There is nowhere a lack of medical supplies or hospital necessities. He reports the need of books, magazines and reading material.

Red Cross Base Hospitals.—The American Red Cross has announced a list of mobile base hospitals, each of which has been organized or is being organized at an initial cost of $25,000, and also two field columns which connect the evacuation or transfer hospitals of the army with the base hospitals; each of these columns having been established at a cost of about $15,555. Each division of troops requires at least one base hospital which will accommodate 500 patients, and the professional staff of which consists of twenty-three medical officers, two dental surgeons, a chaplain and fifty trained nurses assisted by twenty-five volunteer aids. The enlisted personnel numbers 153, and about fifteen civilian employees. The hospitals already organized are as follows:

Presbyterian Hospital, New York (equipment subscribed): Director, Dr. George E. Brewer, also Chief of Surgical Service; principal assistant, Dr. Alfred Stillman; chief of medical service, Dr. Warfield T. Longcope; chief of laboratory service, Dr. Karl M. Vogel; chief nurse, Miss Anna C. Maxwell.

Mount Sinai Hospital, New York (Equipment subscribed): Director, Dr. Nathan E. Brill; chief of surgical service, Dr. Howard Lilienthal; chief of medical service, Dr. Richard Weil; chief of laboratory service, Dr. George Baehr; chief nurse, Miss Elizabeth A. Greene.

Bellevue Hospital, New York (Equipment subscribed): Director, Dr. George David Stewart, also chief of surgical service; chief of medical service, Dr. Van Horne Norrie; chief of laboratory service, Dr. Charles Norris; chief nurse, Miss Clara D. Noyes.

New York Hospital, New York (Equipment subscribed): Director, Dr. Charles L. Gibson, also chief of surgical service; chief of medical service, Dr. Lewis A. Conner; chief of laboratory service, Dr. William J. Elser; chief nurse, Miss M. H. Jordan.

New York Postgraduate Hospital, New York (Equipment subscribed): Director, Dr. Samuel Lloyd; chief of surgical service, Dr. Edward W. Peterson; chief of medical service, Dr. Arthur F. Chace; chief of laboratory service, Dr. Ward J. MacNeal; chief nurse, Miss Amy Patmore.

Brooklyn, for Navy (Equipment subscribed): Director, Dr. William B. Brinsmade, also chief of surgical service; chief of medical service, Dr. Luther F. Warren; chief of laboratory service, Dr. Robert F. Barber; chief nurse, Miss Frances Van Ingen; assistant, Mrs. Lillian H. Read.

Massachusetts General Hospital, Boston (Equipment subscribed): Director, Dr. Frederic A. Washburn; chief of surgical service, Dr. George W. W. Brewster; chief of medical service, Dr. Richard C. Cabot; chief of laboratory service, Dr. J. Homer Wright; chief nurse, Miss Sara E. Parsons.

Boston City Hospital, Boston (Equipment subscribed): Director, Dr. John J. Dowling; chief of surgical service, Dr. Edward H. Nichols; chief of medical service, Dr. John Jenks Thomas; chief of laboratory service, Dr. Arial W. George; chief nurse, Miss Emma M. Nichols.

Harvard University, Massachusetts (Equipment subscribed): Director, Dr. Harvey Cushing, also chief of surgical service; chief of medical service, Dr. Roger I. Lee; chief of laboratory service, Dr. Richard P. Strong; chief nurse, Miss Carrie M. Hall.

Lakeside Hospital, Cleveland (Equipment subscribed): Director, Dr. George W. Crile; chief of surgical service, Dr. William E. Lower; chief of medical service, Dr. Charles F. Hoover; chief of laboratory service, Dr. Howard T. Karsner; chief nurse, Miss Grace Allison.

Rochester, N. Y.: Director, Dr. John M. Swan; chief of surgical service, Dr. Charles W. Hennington; chief of medical service, Dr. William V. Ewers; chief of laboratory service, Dr. Charles C. Sutter; chief nurse, Miss Emma Jones; assistant, Miss Jessica Heal.

Johns Hopkins Hospital, Baltimore: Director, Dr. Winford H. Smith; chief of surgical service, Dr. John M. T. Finney; chief of medical service, Dr. Theodore C. Janeway; chief of laboratory service, Dr. Thomas R. Boggs; chief nurse, Miss Bessie E. Baker.

Harper Hospital, Detroit: Director, Dr. Angus McLean; chief of surgical service, Dr. Clark D. Brooks; chief of medical service, Dr. Burt R. Shurly; chief of laboratory service, Dr. Preston M. Hickey; chief nurse, Miss Emily McLaughlin.

University of Pennsylvania, Philadelphia: Director, Dr. Edward Martin; chief of surgical service, Dr. John B. Deaver; chief of medical service, Dr. Alfred Stengel; chief of laboratory service, Dr. Allen J. Smith; chief nurse, Miss Irwin.

Pennsylvania Hospital, Philadelphia (Equipment subscribed): Director, Dr. Richard H. Harte; chief of surgical service, Dr. John H. Gibbon; chief of medical service, Dr. George W. Norris; chief of laboratory service, Dr. Edward B. Krumbhaar; chief nurse, Miss Elizabeth Dunlop.

Barnes Hospital, Washington University, St. Louis (In process of organization): Director, Dr. Fred T. Murphy; chief of surgical service, Dr. Malvern B. Clopton; chief of medical service, Dr. Walter Fischel; chief of laboratory service, Dr. Eugene L. Opie; chief nurse, Miss Julia Stimson.

Chicago, St. Joseph, St. Mary and Augustana Hospitals (Equipment subscribed): Director, Dr. Albert J. Ochsner, also chief of surgical service; chief of laboratory service, Dr. Oscar E. Nadeau; chief nurse, Mrs. Julie Flekke.

Chicago, Mercy and Wesley Hospitals (Equipment subscribed): Director, Dr. Frederic A. Besley; chief of surgical service, Dr. Joseph F. Jaros; chief of medical service, Dr. Milton Mandel; chief nurse, Miss Daisy Urch.

Cincinnati: Director, Dr. Charles A. L. Reed.

University of Pittsburgh, Pittsburgh: Director, Dr. Robert T. Miller.

Chicago, Presbyterian and County Hospitals (Equipment subscribed): Director, Dr. Frank Billings; chief of surgical service, Dr. Arthur Dean Bevan; chief of medical service, Dr. Ernest E. Irons; chief of laboratory service, Dr. Homer K. Nicoll; chief nurse, Miss Mabel K. Adams.

Chicago, St. Luke's and Michael Reese Hospitals (Equipment subscribed): Director, Dr. Lewis L. McArthur.

Lincoln Hospital, N. Y. (Equipment subscribed): Director, Dr. Frederick Gwyer, New York City.

Rochester, Minn., Mayo Clinic: Director, Dr. Edward S. Judd.

German Hospital, New York: Director, Dr. Frederick Kammerer.

FIELD COLUMNS (AMBULANCE COMPANIES)

New York ($10,000 subscribed for equipment): Director, Dr. T. M. Strong.

Berkeley, Calif.: Director, Dr. Robert T. Legge.

LONDON LETTER

LONDON, July 17, 1916.

The War

THE WOUNDED FROM THE BATTLE OF THE SOMME

The excellent preparations of dealing with the wounded have improved with the experience gained in the war. The means of transport are so efficient that during the first stage of the Battle of the Somme the military hospitals in England began to receive men within twenty-four hours of their being wounded. This rapid evacuation was carried out as the fighting was only begun, and it was necessary to keep the hospitals in France as empty as possible in case of pressure. The casualties were mostly light and due to machine guns, the German artillery having been withdrawn before the British advance.

THE STARVATION OF PRISONERS AT RUHLEBEN CAMP

The thing which causes most concern in this country—more than the heavy loss of life and limb in the war—is the treatment of the British prisoners in the hands of the Germans. In a previous letter I gave the report of the American physician, Dr. Taylor, to the American embassy at Berlin, which confirms what needed no confirmation, the evidence from many sources. In a second report Dr. Taylor states that since his last visit to the Ruhleben camp a sharp reduction has been made in the amount of foodstuffs allotted to the camp and that the diet now falls below that of the military prisoners in other camps. One result of the present ration allotment is already seen in the fact that some of the Jews are appearing at the camp kitchen to secure food which is to them not ritualistically clean. Sir Edward Grey on receiving this statement from Mr. Page, the American ambassador, expressed the view that if the German government were not in a position to feed prisoners of war in their hands properly it was their duty to release them. He stated further that "the German government is detaining a number of British civilians who are in a state of health entitling them to repatriation under the agreement relating to invalid civilians. The German prisoners of war in this country, both combatant and noncombatant, are, as Mr. Page is aware, adequately fed without the aid of parcels from abroad, and his majesty's government is therefore entitled to demand reciprocal treatment for the British prisoners in Germany, or if this is not possible their release." In a third report Dr. Taylor states that the food allowed to the prisoners falls below the figures officially established for the month of June for prisoners of war by Professor Backhaus, head of the

nutrition department of the German ministry of war. Dr. Taylor gives the accompanying table, which shows the terrible deficiency of the Ruhleben diets.

COMPARATIVE DIETS

	Calories	Protein Gm.	Fat Gm.	Carbohydrate Gm.
English laborer	3,655	184	71	570
German farm laborer (Panke)	4,696	143	108	788
Standard diet for a man of moderate activity	2,820	100	100	360
Military prisoners of war in Germany	2,700	80	29	500
Ruhleben diet before reduction	1,580	59	12	308
Diet actually taken when increased by food left by other prisoners receiving supplies	2,725	98	24	523
Ruhleben diet since reduction	1,220	39	6	255
Reduced diet when increased by food left by others	1,930	55	10	410

It will be seen that both the flesh-forming protein and the heat-forming carbohydrates are much lower in the Ruhleben diet than in the prisoner-of-war diet, which is a bare minimum itself. In the case of the fats, the situation is well nigh desperate. Dr. Taylor writes: "All the fat present in the diet is incidentally contained in the several foodstuffs, and the diet is as fat-free as it is practically possible for a diet to be. These figures indicate that the food supplied by the authorities to the interned civilians in Ruhleben during the past week, if applied to all the men, represented less than half of the requisite food units." A notable feature of the diet is the absence of vegetables, a very serious matter, and the substitution of saccharin for sugar, a substitution which was absolutely prohibited in Germany before the war. Dr. Taylor strongly protests against this and points out that less and less food has been coming in from the prisoners' friends abroad, and that, though the number of parcels has increased, the amount of food has gone down. Also much of the bread received has been moldy. The quality of the bread received from Switzerland has greatly deteriorated.

WOMEN MEDICAL STUDENTS AT THE LONDON HOSPITALS

Before the war, women medical students were trained in London only at the Royal Free Hospital, the medical school of which is entirely devoted to that purpose. The war has caused a deficiency of the medical students attending the various hospitals, many of whom have joined the army either as combatants or as ambulance men, while at the same time the want of physicians in the country has greatly increased the number of women entering the profession. The consequence is that a number of the London medical schools—King's College, St. Mary's, and St. George's—which previously received only men have now been thrown open to women, and so far the experiment has been completely successful. It is hoped that other hospitals will follow the example set.

Raw Versus Boiled Milk

The question whether the protection against infection obtained by boiling milk is more than counterbalanced by loss of nutritive properties is still unsettled. A woman physician, Dr. Janet E. Lane-Claypon, who is well known for her researches in regard to milk, has just issued a work under the authority of the Medical Research Committee of the national insurance act. Her conclusions are in favor of boiling, though she is unable entirely to exclude disadvantages. She is inclined to discount any vitalistic theory of the efficiency of natural milk as a constructive in infant feeding. Thus she refers to the "so-called biologic properties of milk," to the "alleged" production of Barlow's disease (infantile scurvy) and rickets by the use of heated milk for infants, and to vitamin theories, which give results that are "somewhat fragmentary." However, she admits that milk contains substances of unknown composition essential for life when milk is the sole diet. But she considers that there is no evidence to show that these substances are destroyed by boiling, especially when the heat is not applied for prolonged periods and when a temperature not exceeding the boiling point is used. The loss of vitamin, she says, if it occurs, is evidently not sufficient to affect the nutritive value of milk. On the other hand, Dr. Lane-Claypon admits that some children thrive better on raw milk, others on boiled milk, and therefore individuality is an important factor.

The Treatment of the Stiff Joints of Soldiers

A new clinic for the physical treatment of stiff joints and wounds has been opened in London under the management of a committee of eminent physicians and surgeons. The arrangements are modeled on those at the Grand Palais in Paris, an institution which, it is stated, has saved the French government a very large sum in pensions—the figure is put as high as $5,000,000 per year. On the ground floor are the "whirlpool baths," the latest modification of which is a bath in which water and air are pumped in together, giving a rushing, torrent-like effect. Upstairs in a large room are mechanical appliances for exercising stiff limbs. These are very ingenious, and comprise foot and hand machines and machines for the body. There will be accommodation for sixty patients a day, and it is hoped soon to extend the scope.

PARIS LETTER

PARIS, July 6, 1916.

The War

EXTRACTION OF BULLETS FROM THE BRAIN

Dr. Cazamian, a naval surgeon, has just reported to the Société de chirurgie de Paris two cases in which he has practiced late extraction of projectiles from the brain at one sitting with the help of roentgenoscopy. The following is the technic employed: Two roentgenograms are made to locate the projectile. The latter's position being thus approximately ascertained, trephining is performed on the nearest part of the cranium. The dura mater having been incised, the Roentgen-ray screen is brought into action. The foreign body, once detected, is seized by forceps introduced into the brain substance and is thus extracted. The operation takes very little time and is very simple, as is proved by Cazamian's two cases in each of which perfect recovery resulted. In the first a shrapnel bullet penetrated, from the right side, the posterior frontal region, and, traversing the two hemispheres, lodged 1 cm. below Broca's convolution. The bony fragments at the orifice of entry were removed in the ambulance. Right facial paralysis with aphasia of a subcortical type persisted. Three months after the injury, the bullet was extracted, as described, by trephining from the left side. Immediately after the operation, complete aphasia was manifested for several days, but four months afterward there was no sign of any motor or speech trouble. In the second case a rifle bullet penetrated behind the ramus of the left lower jaw and lodged on the upper border of the left petrous bone near the gasserian ganglion. The patient suffered from very severe neuralgia of the trigeminal, rendering life scarcely bearable. Trephining above the auditory meatus, Cazamian was easily able to extract the bullet, and the pains disappeared, as well as certain visual troubles which had previously been noted.

This question of extraction of bullets lodging in the brain is still under discussion. Dr. Rochard is of the opinion that the operation is indicated only when the presence of the foreign body causes motor or sensory nervous troubles, or in case of infection.

Professor Quénu thinks, on the contrary, that the mere absence of symptoms does not justify abstention, for the patient is always at the mercy of untoward happenings which, after months or years, may suddenly occur and cause death. This is not the same thing as saying that one should always remove foreign bodies lodged in the brain. One must take into consideration the volume of the body and its situation. If it is deeply placed and the operation promises to be difficult and serious, it is better to abstain. If the projectile is extremely small and its presence causes no symptoms, one may leave it alone. If the projectile is large and within reach, and if its extraction does not present too many difficulties, it is better to attempt it.

Dr. Walther is entirely of Quénu's opinion. Dr. Routier thinks that all foreign bodies of the brain should be removed, if the operation can be done without causing too much risk to the patient, because sudden death is frequently the result of leaving these foreign bodies. It must be remembered, however, that, even after the removal of foreign body, there may be serious sequelae. Thus a long time ago Routier removed a revolver bullet from the anterior cerebral lobe of a wounded man. Five years afterward the patient, who had been in good health, died suddenly.

Dr. Chaput stated that after localizing an intracerebral projectile by the Roentgen rays, he practices trephining at the point nearest to the projectile and then explores the cerebral substance with a small director. When he detects, by this means, the bullet, he passes the forceps along the sound, seizes the projectile and extracts it. The same subject was discussed at the Réunion médico-chirurgicale de la IV-e armée where Dr. Potherat, surgeon of the hospitals of Paris, remarked that, in view of the evidence of frequent late infec-

tion often causing the death of patients in whose brain a projectile is lodged, many surgeons have gone so far as to recommend the extraction of bullets whenever it is materially possible. Potherat communicated four such cases in which the operation had not been attended with any great difficulty. In one of these cases the removal had been practiced early. The patient recovered and remained well. In the three others extraction was a secondary operation and was called for by complications occurring after an interval of from a few weeks to a month. One of these last three recovered and two died, giving for four cases 50 per cent. of recoveries. On the whole, the results are such as to encourage surgeons to intervene. The operation should be performed as soon as possible, and before the development of complications which may prove fatal.

THE WAR AND THE SURGICAL CONGRESS

At its annual meeting, which has just taken place, the committee of the Association française de chirurgie decided that the French surgical congress will not be held during the war, and the Austro-German, Bulgarian and Ottoman members of the association were dropped from membership.

THE FRENCH WOUNDED EMERGENCY FUND

The French Wounded Emergency Fund is an organization which took rise during the early part of the war, just after the retreat from Belgium and the battle of the Marne. It has its headquarters at London, and is under the honorary presidency of the marchioness of Linlithgow. The membership list includes the greatest names of the English aristocracy and those of a certain number of rich Americans who have contributed generously to its funds. The work is officially approved by the French government, and is under the patronage of the British ambassador. In France the honorary presidents are the Duchess of Rohan and M. Etienne, former minister of war. Very large sums are spent monthly on goods for the military hospitals such as dressings, bandages, clothes and supplies of all kinds. The delegates visit every day the hospitals of the different regions to which they are assigned, and, with the assistance of the surgeons in chief of these establishments, draw up lists of their needs, which lists are sent to London. Here a large staff of women volunteers packs and dispatches, as quickly as possible, these objects, thus demanded, to the French hospitals. In 1915 more than 550 military hospitals were thus kept provisioned through the agency of fourteen delegates working in these regions. May 31, the number of hospitals thus supplied was 1,198, and the total of the gifts exceeded in value 2,000,000 francs ($400,000).

THE BETTER UTILIZATION OF PHYSICIANS AND PHARMACISTS IN THE ARMY

Deputy Le Rouzic, having requested the minister of war to have drawn up for each region, by the directors of the health service, a list of physicians and pharmacists who have been mobilized and who were members of the departmental health commissions, with a view to utilizing their special competency in military life as it had been used in civil life, has received the following answer: "The military health service does its utmost to utilize special competences in the interests of the sick and wounded. Thus to each regional direction have been attached: one assistant director, whose principal mission is to inspect the military establishments, hospitals, etc., and to take such measures as are necessary from the point of view of hygiene; assistant pharmacists attached to the directors; technical medical advisers, and assistant advisers whose rôle consists in studying and proposing such measures of prophylaxis as in the course of their inspections they have found necessary. The list will be drawn up for each regional direction, and this will permit making use of the special knowledge of the persons whose names appear on this list. They will, however, not be employed in their usual place of residence as long as they belong to classes which have not been discharged from military obligation.

Personal

At its last sitting, the Académie de médecine elected two foreign associate members, Dr. E. Perroncito, professor of bacteriology at the University of Turin, and Professor Kitasato, director of the bacteriologic institute at Tokyo.

At the sitting of June 26, the Académie des sciences elected two foreign corresponding members. Dr. Ramon y Cajal of Madrid was elected to fill the place of M. Perez in the section of anatomy and zoology. Dr. Morat, professor of physiology at the Faculté de médecine de Lyon was elected for the section of medicine and surgery to succeed Dr. Zambaco Pasha.

Marriages

MARY ADELAIDE GASTON, M.D., Cerro Gordo, Ill., to Mr. Walter Malcolm McLeod of Vega Baja, P. R., at Cerro Gordo, July 19.

WALLACE S. PETTY, M.D., Rutledge, Mo., to Miss Helen Larson of Oshkosh, Wis., at Excelsior Springs, Mo., June 28.

CLIFFORD CLINTON HARTMAN, M.D., Pittsburgh, to Miss Carlotta Barnes Bailey of Aberdeen, Md., May 23.

ADRIEL CLARK WEAKLEY, M.D., to Miss Evelyn Guthrie, both of Shelbyville, Ky., in Louisville, Ky., July 6.

KLINE V. MENEFEE, Cincinnati, to Miss Fay Rogers of Falmouth, Ky., at Louisville, Ky., July 20.

ROBERT BENONI FLEEGER, M.D., Lead, S. D., to Miss Maude Morrison of Vancouver, B. C., June 26.

ROBERT JENNINGS HANLEY, M.D., to Miss Cathron Smith, both of Billings, Mont., July 15.

DAVID CORBIN STREETT, M.D., to Miss Ferebe Buion Westcott, both of Baltimore, July 19.

WILLIAM AUSTIN TOMES, M.D., to Miss Gertrude A. Ryno, both of Brooklyn, December 15.

BERTRAM ARTHUR RICHARDSON, M.D., to Miss Ethel Wyllie, both of Emington, Ill., July 5.

EDWARD JOHN MILLER, M.D., to Miss May Janice Shannon, both of Chicago, July 26.

GEORGE ARNOLD MOLEEN, M.D., to Mrs. May Luff Conway, both of Denver, July 20.

JOSEPH LEWIS HUTTON, M.D., to Miss Anna Jost, both of St. Louis, July 17.

Deaths

George Louis Painter, M.D., Berkeley and San Francisco, University of California, San Francisco, 1896; aged 45; a member of the Medical Society of the State of California; acting assistant surgeon, U. S. Army, and later assistant surgeon, U. S. V., with rank of captain, who went to the Philippine Islands with the First California Infantry on the first expedition and served acceptably with that command and on the general staff; was marching in the Preparedness Parade in San Francisco, July 22, when a bomb was exploded and a jagged piece of metal struck him in the abdomen, causing injuries from which he died in the Emergency Hospital, a short time later.

Surgeon Emlyn Harrison Marsteller, Lieutenant-Commander, U. S. Navy (ret.), Washington, D. C.; University of Virginia, Charlottesville, 1872; aged 65; a Fellow of the American Medical Association and a member of the Association of Military Surgeons of the United States; who entered the Navy, Jan. 12, 1876, and after participation in the Battle of Manila Bay as surgeon of the *Raleigh*, and fifteen years and three months of sea service and thirteen years and eight months of shore or other duty, was retired Sept. 15, 1908, on his own application after thirty years' service; died at his home in Washington, July 23, from heart disease.

John A. McElveen, M.D., Chariton, Iowa; Bennett Medical College, Chicago, 1872; aged 81; local surgeon for the Burlington System; formerly state senator for the Fourth Iowa District; formerly president of the Iowa Eclectic Medical Society and of the Provincial and National Boards of Health; formerly president of the state board of health and of the State Board of Medical Examiners; vice president of the State Savings Bank, Chariton, and director of the Lucas County National Bank; died at his home, July 17, from cardiac asthma.

William Abbott Phillips, M.D., Evanston, Ill.; Harvard Medical School, 1887; aged 55; a member of the Illinois State Medical Society; at one time lecturer on comparative anatomy in Northwestern University Medical School, Chicago; curator of the ethnologic museum of Northwestern University; a member of the American Association for the Advancement of Science; an archeologist of repute; chief of the medical staff or the Evanston Hospital; died at his home in Evanston, July 24.

Asa Stearns Wilcox, M.D., Minneapolis; Hahnemann Medical College, Philadelphia, 1885; aged 57; professor of prac-

tice of medicine and diseases of women in the University of Minnesota College of Homeopathic Medicine and Surgery, Minneapolis; a member of the medical staff of the Minneapolis City Hospital and gynecologist to the Homeopathic Hospital; died at the home of his sister in Minneapolis, July 17, from pneumonia.

Price Emerson Murray, M.D., Atlanta (Ga.) Medical College, 1886; aged 62; who retired from medicine on account of his business interests, several years ago; a director of the Hibernian Building and Loan Association and Germania Savings Bank, Atlanta; and for several years local superintendent of the Western Union Telegraph Company and part owner of the Chattanooga *Times;* died in a sanatorium in Atlanta, July 20.

Melville George McHugh, M.D., Chicago; Creighton Medical College, Omaha, 1900; aged 38; formerly a member of the Illinois State Medical Society; a specialist on tuberculosis and connected at one time with the Tuberculosis Hospital at Dunning; died in the Swedish Covenant Hospital, Chicago, July 24, from peritonitis following a surgical operation.

Daniel Yingling, Huntington, Ind. (license, Indiana, 1897); a practitioner since 1866; aged 76; for several terms president and secretary of the Huntington (Ind.) Board of Health; a member of the school board and of the board of public works; who fell several months ago, sustaining a fracture of the hip; died at his home, July 17, from heart disease.

Charles H. Johnson, M.D., Austin, Minn.; McGill University, Montreal, 1884; aged 57; formerly a Fellow of the American Medical Association; a member of the Minnesota State Medical Association; twice mayor of Austin; died in the Great Northern Hotel, Chicago, July 25, from heat exhaustion.

John Thomas Longino, M.D., Fairburn, Ga.; Southern Medical College, Atlanta, Ga., 1893; aged 47; a member of the Medical Association of Georgia; formerly senator from the Thirty-Sixth Senatorial District and representative from Campbell County in the legislature; died at his home, July 19, from nephritis.

Louis Augustus Woodbury, M.D., Groveland, Mass.; Harvard Medical School, 1872; aged 71; a member of the Massachusetts Medical Society and of the New Hampshire Association of Army Surgeons; a veteran of the Civil War; a practitioner and druggist of Groveland; died at his home, July 17.

Alvah Conant Lewis, M.D., Salt Lake City; College of Physicians and Surgeons in the City of New York, 1877; aged 56; formerly a member of the Utah State Medical Association; died about July 14, at Ocean Beach, Calif., where he had gone in the hope of regaining health.

James William Ashford, M.D., Canyon City, Ore.; Cooper Medical College, San Francisco, 1878; aged 59; formerly a member of the American Medical Association; for many years county physician of Grant County, Ore.; died at his home, July 11, from chronic myocarditis.

Preston G. Stebbings, M.D., Chico, Calif.; formerly of Bradley, Ill.; Rush Medical College, 1871; aged 83; for sixty-two years a practitioner, and for the last eight years a resident of California; died at his home, July 18, from cerebral hemorrhage.

Joshua S. Wood, M.D., Irwinton, Ga.; Atlanta (Ga.) Medical College, 1875; aged 72; also a druggist; for several years a county commissioner of Wilkinson County, Ga., and senator from the twenty-first district in 1888 and 1889; died at his home, July 20.

John Martin, M.D., Caldwell, Ohio; Miami Medical College, Cincinnati, 1869; aged 86; assistant surgeon of volunteers during the Civil War; for more than fifty-two years a practitioner of Caldwell; died at his home, July 23, from heart disease.

William Henry Erwin, M.D., Oak Grove, Mich.; Long Island College Hospital, Brooklyn, 1877; aged 64; for nearly forty years a practitioner of Oak Grove; died at the home of his son in Howell, Mich., July 16, from carcinoma of the gallbladder.

George Frederick Schug, M.D., Williamsburg, Iowa; Jefferson Medical College, 1904; aged 35; formerly a member of the Iowa State Medical Society; died in the Mayo Brothers Hospital, Rochester, Minn., July 24, after a surgical operation.

Thomas P. Reville, M.D., Folkston, Ga.; College of Physicians and Surgeons, Baltimore, 1887; aged 56; a Fellow of the American Medical Association and a physician of Charlton County, Ga.; died at his home, June 20, from heart disease.

Romulus Alonso Whitaker, M.D., Kinston, N. C.; College of Physicians and Surgeons, Baltimore, 1885; aged 59; a member of the Medical Society of the State of North Carolina; died at his home, July 18, from cerebral hemorrhage.

Leon Lewis Patterson, M.D., Arapaho, Okla.; University of Oklahoma, Norman and Oklahoma City, 1911; aged 35; a Fellow of the American Medical Association; died in the Clinton (Okla.) Hospital, July 22, from typhoid fever.

Clarence Appleton Kirkpatrick, M.D., Namkham, Burma; University of Pennsylvania, Philadephia, 1910; aged 29; a medical missionary of the Baptist board at Namkham, Northern Shan States, Burma; died at his station, recently.

Thomas C. Elmendorf, M.D., Portchester, N. Y.; New York Homeopathic Medical College, New York, 1875; aged 62; formerly president of the village health board; died at his home, July 18, from cerebral hemorrhage.

Boswell Henson Stillyard, Wheeling, W. Va. (license, West Virginia, 1882); aged 69; for forty years a practitioner; a member of the second branch of the Wheeling City Council; died at his home, July 17, from nephritis.

James Smiley Bush, Jr., M.D., Saranac Lake, N. Y.; Atlanta (Ga.) College of Physicians and Surgeons, 1912; aged 31; formerly of Colquitt, Ga.; died in Albuquerque, N. M., July 14, from tuberculosis.

Herman G. Tarter, M.D., Chilhowie, Va.; Medical College of Virginia, Richmond, 1911; aged 31; a member of the Medical Society of Virginia; died at his old home in Wytheville, Va., July 15.

Roscoe Smith, M.D., Auburn, Me.; Harvard Medical School, 1870; aged 79; a veteran of the Civil War; representative from Turner Center in the Maine legislature in 1891; died at his home, July 8.

William W. Rambo, Alston, Ark. (license, Arkansas, 1903); aged 63; a member of the Arkansas Medical Society; a practitioner since 1884; died suddenly at his home, July 16, from heart disease.

John J. Arnold, Thicket, Texas (license, Ninth Judicial Board, Texas, 1900); aged 43; physician and surgeon to the Foster Lumber Company, and the Arnold Mill; died at his home, July 19.

Isaiah Titchanall Prickett, M.D., Parkersburg, W. Va.; Miami Medical College, Cincinnati, 1876; aged 79; died at his home, May 18, from carcinoma of the intestines and bladder.

Robert Benjamin Chisholm, M.D., Summitt, Miss.; Tulane University, New Orleans, 1903; aged 52; a member of the Mississippi State Medical Association; died at his home, July 16.

Herman Gasser, M.D., Platteville, Wis.; Northwestern University Medical School, 1883; aged 59; formerly a Fellow of the American Medical Association; died at his home, July 6.

Norman Webb Chance, M.D., Little Falls, Minn.; Rush Medical College, 1888; aged 57; formerly a member of the Minnesota State Medical Association; died at his home, July 2.

George W. Goodner, M.D., Chicago; Northwestern University Medical School, 1869; aged about 75; died at his home in Chicago, in May, from the result of accidental burns.

Clarence V. Gray, M.D., Batavia, N. Y.; University of Buffalo, N. Y., 1887; aged 50; proprietor of the Primrose Sanitarium, Batavia; died at his home, July 6, from diabetes.

Henry H. Stimson, M.D., Saugatuck, Mich.; Bennett Medical College, Chicago, 1870; aged 92; a practitioner of Saugatuck for more than sixty years; died at his home, July 14.

Charles Marcus Sandford, M.D., Brighton, Ont.; Trinity Medical College, Toronto, Ont., 1886; aged 53; died in Brighton Village, Ont., from diabetes, April 11.

Armistead Burt, M.D., Pinon, N. M.; Tulane University, New Orleans, 1861; aged 78; a veteran of the Civil War; died at Orange, N. M., June 7.

Freeman Austin Durkee, East Andover, N. H. (license, New Hampshire, 1897); aged 83; died in his home, April 29, from cerebral hemorrhage.

Aaron L. Bowman, M.D., Rochester, Ind.; Illinois Medical College, Chicago, 1908; aged 40; died at his home in Talma, Ind., July 5.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

WINE OF CARDUI SUIT

(*Continued from page 385*)

June 6, 1916, Morning

The Court met pursuant to adjournment. Mr. Williams, attorney for the plaintiff, the Chattanooga Medicine Co., announced that by mutual agreement depositions which had not been read would be treated as read and as in the record. It is the intention of the plaintiffs to close their case by Thursday, June 8, at noon.

TESTIMONY OF DR. THOMAS G. ATKINSON

Dr. Thomas G. Atkinson was called as witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. WALKER

Dr. Atkinson testified that he is a physician and medical journalist.

Q.—From what school, doctor, did you graduate, and please tell us the various positions you have held. *A.*—In 1887—I think I am right on the date—I took what is called the Intermediate Bachelor of Science at the University of London. I then took four years' medical course partly in St. Bartholomew's and partly in St. Mary's London, but of course English Medical Schools don't graduate one as they do over here. One simply gets a license from the Royal College of Physicians to practice.

Immediately after that I spent a year in Paris, which, however, was nothing but informal, unsystematic attendance at the hospital clinics at the Hotel Dieu and the Hotel Charlotte and a few others.

Later I came to this country and took a special course in homeopathic medicine at a school in Cleveland which I believe at that time was called the Cleveland Homeopathic Hospital College. It has changed its name since.

Later I graduated at the Chicago College of Medicine and Surgery in this city, with the degree of M.D.

Q.—What is your age, please? *A.*—About 46.

Q.—Now, doctor, what schools have you been connected with as a teacher, if any, and in what branch of your profession? *A.*—I was Professor of Physiology for two or three years in the Chicago College of Medicine and Surgery for one year. I was professor of physiology at the American Medical College in St. Louis for three years. I was associate professor in neurology in both these places at the same time and I was professor of therapeutics for two years in the Jenner Medical College.

I am at present the editor of the *Medical Standard*, published in this city, and the *Medical Brief*, published in St. Louis, and I was formerly Associate Editor of the *American Journal of Clinical Medicine*, but I am no longer associated with that.

Q.—Are you in the practice of your profession, also, doctor? *A.*—Yes, sir.

Q.—Where is your office? *A.*—At 14 W. Washington Street.

Q.—How long, or over what period of time have you been engaged, as a part of your labor, as the editor of medical journals, or associate editor, or writing on medical subjects? *A.*—Since 1906, about 10 years.

Q.—And are you connected with that work now? *A.*—Yes, sir.

Dr. Atkinson stated that in the last three years he has confined himself to ophthalmology and has had the clinical experience which comes with his teaching positions. He defined a therapeutist as a man who has some expert knowledge of the application of drugs and other remedial measures to disease. He lectured as a full professor on this subject for two years, and also lectured at the Chicago College of Medicine and Surgery in Dr. Funck's department. In his journalistic work was included review of scientific works, articles and books. He is familiar with the diseases of women.

The witness testified that Mr. Hough engaged him as a special expert to look up literature and make researches on the subject of the drugs at issue about a year ago last March. He has never used carduus benedictus in his practice. He looked it up in the literature. He was asked to state the history of carduus benedictus. Objection was made, the Court stating that if the witness could give the bibliography on the subject the question might be competent. The Court, after discussion, ruled that the witness could not answer questions as to the use of carduus benedictus as a medical agent as read from books. The same ruling was made on viburnum prunifolium.

Dr. Atkinson stated that he is familiar with the pelvic organs of the female. He defined a pharmacologist as a laboratory man of the therapeutist who furnishes him with just one of the data on which a therapeutist bases his therapeutic judgment and knowledge.

The witness stated that he has never done any experimenting in pharmacology. He has seen it done and has directed its experimentation in the physiologic laboratory. He stated that a negative pharmacologic test as pharmacology at present stands would certainly not indicate the therapeutic value or valuelessness of the drug. A therapeutic test, he stated, includes a pharmacologic test and a clinical test, and he believes there is a difference between the action of drugs on a well person and on a sick person. He has used the fluidextract of viburnum in his practice in any condition in which he thought a uterine tonic and sedative was indicated, chiefly in dysmenorrhea, menorrhagia, threatened abortions, and in any diseases of the female pelvic organs in which there was pain or tenseness. It would also be indicated in various inflammations.

From his reading Dr. Atkinson believes that carduus benedictus has therapeutic value. He regards it as being in the same class as viburnum, and, therefore, having the same indications as viburnum. He considers the two drugs as synergistic—namely, when two drugs of similar action are combined and given in combination the joint action, so far as their similarity goes, is greater than the added sum of the two.

Dr. Atkinson defined a medicinal wine as a preparation, an extract of a drug made either with the wine itself, or in a weak solution of alcohol, whose alcoholic content is approximate to that of the wine. He considered that the medicine known as Wine of Cardui, assuming that it contained the extractives of 30 grains of carduus benedictus and three grains of viburnum prunifolium in each dose, in a solution of 20 per cent. alcohol, to have therapeutic value in diseases peculiar to the female. He believes that certain drugs have a selective action on certain parts of the body. He stated there were certain tonics which have such action—he could not tell how they act, but he knows that they do act. There are certain drugs, he believes, which have a selective action on the uterus of the female; that is, they show their greatest effect on the uterus, but they also have effect on other organs. He mentioned ergot, hydrastis, helonias, viburnum prunifolium, viburnum opulus, sepia and carduus benedictus. He stated that the medicine named (Wine of Cardui) would be of value in amenorrhea, menorrhagia, metrorrhagia and dysmenorrhea.

Q.—Are medicines ever given—what I am trying to get at is this: amenorrhea is suppression? *A.*—Yes.

Q.—And menorrhagia is excessive flow? *A.*—Yes.

Q.—Will you explain—you said it would in all of them—how a medicine can be of value in suppression and in an excessive flow, that is, in what appears to be opposite conditions. Please tell the jury, will you? *A.*—Well, for one thing—

Q.—Doctor, when you hold your head down, you drop your voice. *A.*—For one thing, the two opposite manifestations may be due to the same underlying cause. For instance, just as an illustration, an endometritis, which is an inflammation of the inside of the womb, may, in different women, and even in the same woman at different times, produce at one time an amenorrhea, a suppression of the menses, and at another time a flooding or menorrhagia. At other times, neither one nor the other, but a dysmenorrhea, a painful menstruation, and inasmuch as it is the inflammation of the womb that lies at the root of all these three troubles, the same remedy may and probably will help them all. That is one reason why such a thing may happen.

I think there is a broader reason that we ought to bring out, and that is, that medicines don't do the thing at all. Medicine don't walk into a body and pick up an organ and move it around. Medicine don't go in and cure disease. Medicines simply stimulate the proper agencies within the body—

Q.—Naturally there you mean? *A.*—The recuperative and defective agencies of the body itself, to do its own recovery, and the body is very intelligent in its recuperative work. I think that must be quoted as one reason why drugs often seem to help seemingly opposite conditions.

Q.—When you use that second phrase, this second reason that you give, does that apply generally to all drugs? *A.*—Yes. Oh, there are a few instances where we give drugs for the direct mechanical—or, as we call it, physiological action of the drug. We sometimes give enormous doses of irritative cathartics out of which we expect to get

just the direct irritative effect of the drug. But, as a rule, the giving of medicines is not with any idea that the medicine itself is going in there to do something wonderful, but that the medicine is going to stimulate the natural recuperative and defective agencies of the body to do its own recovering.

The witness named several conditions of sterility in which the medicine indicated might be of value. He stated that medicine is indicated in puberty when there is suffering. In his opinion 80 per cent. of women suffer at the time of puberty. He believes that the medicine named would be of therapeutic value in these cases. In his judgment general and special tonics are indicated in pregnancy to aid childbirth. In his opinion Wine of Cardui is a general and a special tonic. He does not see how it could mask a cancer in a woman at the time of the menopause. He considers Wine of Cardui a helpful tonic and a good combination for a woman during the menopause.

There was described to the witness the experiment performed by Dr. John Clarence Webster. He considered this experiment as having absolutely no value as a test for the therapeutic value of a medicine when given through the mouth to a woman suffering with female troubles. The fact that, injected into the circulation, it did not produce any effect on the respiration or the circulation would not, in his opinion, show anything with reference to the therapeutic value of the same drugs given by the mouth to women suffering with female trouble because there are dozens of valuable drugs that would not influence the circulation or respiration under those circumstances.

Q.—Well, will you tell us, then, if you please, how such drugs could act, if taken through the mouth, where they do not affect the respiration or the circulation; and, if you can, illustrate that? A.—Well, just as one illustration, we will take iron. Iron, whether it is taken through the mouth, or whether it is injected, as you suggested in your hypothetical question, would not have made the slightest difference in the tracings of the respiration and the blood and the pulse; and yet, I suppose, everybody admits the therapeutic value of iron taken through the mouth.

There was called to the attention of the witness a query and minor note published in THE JOURNAL as to the use of alcohol in medicine and the witness was asked to interpret a statement from this query. The Court ruled that the statement was perfectly plain and the jury could interpret it for themselves.

The witness stated that at least an ounce of alcohol could be taken by an adult during twenty-four hours, without harm if taken through a period of twenty-four hours and properly diluted. He stated that he could not see how Wine of Cardui taken in the dosage indicated would tend to heighten the passions of a young girl at puberty, nor could he see how it would give her an alcoholic habit. He did not believe it would produce disease in a pregnant woman or give the woman or the child an alcoholic habit.

Dr. Atkinson stated that there are many drugs used by physicians in alcoholic preparation. He believes that the inclusion of a drug in the pharmacopeia means that it is in common use at the time the pharmacopeia is made up; its inclusion in the dispensary does not mean anything.

Objection was made and sustained on questions as to the inclusion of carduus benedictus in various pharmacopeias.

The witness stated that he has read the Home Treatment Book for Women issued by the Chattanooga Medicine Company in 1913.

Dr. Atkinson stated that he is not competent to say what proportion of women suffering with female troubles are surgical cases. There are cases that are nonsurgical and he believes that Wine of Cardui in the dosage named would be indicated in such cases. He could not say how the medicine acts in remedying displacements. The medicine does not do it, but stimulates the body process so that they do it. There is no doubt that under the influence of medicine many of these cases of displacement do become righted, he believes. There are, in his opinion, displacements which do not give rise to symptoms.

The witness defined vaginitis and inflammation of the vagina and stated that this medicine would be of therapeutic value in such cases. He also believes it would be of therapeutic value in cases of leukorrhea or whites.

An adjournment was taken until 2 o'clock the same day.

June 6, 1916, Afternoon

The cross-examination of Dr. Thomas George Atkinson was suspended temporarily.

TESTIMONY OF MR. HENRY CLAY EVANS

Mr. Henry Clay Evans was called as a witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. WILLIAMS

Mr. Evans testified that he has resided in Chattanooga for fifty-two years. He has been commissioner of education, alderman several times, mayor twice, a member of congress, first assistant postmaster general, commissioner of pensions, counsel general to London, commissioner of the city, and commissioner of education and health of Chattanooga. He has known Mr. John A. Patten and Mr. Z. C. Patten, Jr., ever since they were boys. The witness was asked as to the reputation of John A. Patten and of Z. C. Patten, Jr., prior to April, 1914, for honor, integrity and fair business dealing in that community. Objection was made to the question.

After considerable argument the Court stated that he had announced the presumption that, until the contrary is shown, these men are good citizens, and he had decided to let the evidence in on that basis. Exception to the ruling was made by the defendants.

The witness stated that the reputations of the Messrs. Patten were very good. He never heard their reputations questioned.

TESTIMONY OF MR. FOSTER W. BROWN

Mr. Foster W. Brown was called as a witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. WILLIAMS

Mr. Brown testified that he has been practicing law in Chattanooga for thirty years. He has been living in Chattanooga for twenty-five years. He was a member of Congress one term; attorney general to Porto Rico two years and attorney general of his Chattanooga District for eight years. He testified to the same extent as the last witness regarding the reputation of Messrs. John A. and Z. C. Patten, Jr.

Cross-examination was waived.

Objection to the testimony was made, overruled and exception taken.

TESTIMONY OF MR. J. M. LITTLETON

Mr. J. M. Littleton was called as a witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. WILLIAMS

Mr. Littleton testified that he has lived in Chattanooga for five years. He is the mayor of Chattanooga. He testified to the same extent as the two previous witnesses.

CROSS-EXAMINATION BY MR. SCOFIELD

Q.—What is your business, Mr. Littleton? A.—Beg pardon?
Q.—What is your business? A.—I am a lawyer.
Q.—Is there any other business you are engaged in? A.—I am mayor of Chattanooga.
Q.—Are you engaged in any business besides that? A.—No, sir.
Q.—You are not? A.—No, sir.
Q.—Never have been? A.—Well I am—I have owned a farm, I am a pretty good farmer.
Q.—Your name is J. L.? A.—J. M.
Q.—J. M.? A.—Yes, sir.
Q.—Have you been connected with any manufacturing companies? A.—Why, I have had small stock in manufacturing companies, not enough to bring forth great dividends, different companies.
Q.—What companies have you been in? A.—Well, I do not know that I could name them, sir, several small ones.
Q.—Have you been associated with any chemical company? A.—Oh, yes, I own some stock in a chemical company.
Q.—What is the name of that company? A.—Anedcmin Chemical Company; I own stock in it.
Q.—What is the business of that company? A.—That company manufactures a medicine.
Q.—Who is your partner down there in the practice of law? A.—My partners are my nephews, my brother's two sons, Littleton & Littleton.
Q.—Is there a man down there by the name of Estil? A.—Estil?
Q.—Yes. A.—My father-in-law, Judge Estil, was my partner when I lived at Winchester, yes, sir.
Q.—This chemical company has their offices right above yours? A.—No, sir; they did have in Winchester, in a building that was owned by me.

Q.—That was a proprietary medicine that they were making and selling? A.—Yes, sir.

Q.—A secret formula? A.—Yes, sir.

The attorneys for the plaintiff moved that the cross-examination be stricken out. The motion was denied and exception taken.

TESTIMONY OF MR. ALBERT L. KEY

Mr. Albert L. Key was called as a witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. WILLIAMS

Mr. Key testified that he is retired from the U. S. Navy and is at present vice president and general manager of the Volunteer State Life Insurance Company, at Chattanooga. He has resided in Chattanooga since 1860. He testified to the same extent as the previous witnesses.

CROSS-EXAMINATION BY MR. T. J. SCOFIELD

The witness testified that Mr. Z. C. Patten, Sr., is president of this insurance company.

TESTIMONY OF MR. DWIGHT PRESTON MONTAGUE

Mr. Dwight Preston Montague was called as a witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. WILLIAMS

Mr. Montague testified that he has resided in Chattanooga since 1875. He testified as to character in the same way as previous witnesses.

CROSS-EXAMINATION BY MR. T. J. SCOFIELD

The witness named the companies in which he is interested and stated that neither of the Pattens had stock in any of these companies.

TESTIMONY OF DR. THOMAS G. ATKINSON. (*continued*)

Dr. Thomas George Atkinson resumed the stand for the plaintiff.

CROSS-EXAMINATION BY MR. T. J. SCOFIELD

Q.—Doctor, do you know what Wine of Cardui is composed of? A.—No, not of my own knowledge.

Q.—You know what some of the contents of Wine of Cardui are, do you not? A.—I know, of course, that it contains alcohol, of my own knowledge.

Q.—Well, you know more than that, don't you? A.—No, only from being told.

Q.—You know what the Chattanooga Medicine Company relies upon, do you not, for the action which they claim for Wine of Cardui. A.—Oh, yes.

Q.—What is that? A.—Viburnum prunifolium and carduus benedictus.

Q.—You have been in the employ of the Chattanooga Medicine Company for some time, haven't you, doctor? A.—Yes, sir.

Q.—You have been in the employ of the company for something over a year? A.—Yes, sir.

Q.—What compensation do you receive?

Mr. Walker:—That is objected to.

Mr. T. J. Scofield:—Have you a stipulated, agreed compensation, with the Chattanooga Medicine Company, or their representatives, for your services? A.—Yes, sir.

Q.—What is that, doctor?

Mr. Walker:—That is objected to.

THE COURT:—He may answer. This is an agreed compensation.

To which ruling of the Court the plaintiff, etc., excepted.

A.—During the time that I was working on research work I received $35 a week. During the time that I am in court, I receive $50 a day.

Mr. T. J. Scofield:—Now, what length of time were you engaged in research work? A.—I don't quite catch what you mean, Mr. Scofield? Do you mean how much actual time?

Q.—You say you were to receive $35 a week while doing research work. Now I am asking you how much time you put in, in research work, on research work? A.—I want to answer your question the way you want it.

THE COURT:—No, you got $35 for a certain kind of work. How much of that kind of work did you do? That is the question. A.—Oh, it varied from week to week. Some weeks I would do very little, and some weeks I would put in whole days on it.

Mr. T. J. Scofield:—The question I am asking you, is how many weeks of research work you did. You say you were receiving $35 a week for it. A.—No, I said I was receiving a fixed stipend of so many dollars a week to hold myself at the disposal of the Chattanooga Medicine Company.

Q.—That is, while you were doing research work? A.—Yes.

THE COURT:—Was that all the compensation you received for all kinds of service? A.—Yes, except when I was in court.

Mr. T. J. Scofield: Q.—Or when you were away from home, attending court for them? A.—Yes.

Q.—For instance, you went down to Chattanooga on the 29th of January, didn't you? A.—Yes, sir.

Q.—And from that day on, until you returned to Chicago, you were receiving $50 a day? A.—Yes, sir.

Q.—And your expenses? A.—Yes, sir.

Q.—And this case was called on the 21st day of March here in this court? A.—Yes, sir.

Q.—And since that time, you have been receiving $50 a day, for your services? A.—Yes, sir.

Q.—Now, in addition to the research work, you have done considerable correspondence, haven't you, in connection with this case here, or in behalf of your client in this case here? A.—Oh, I do not think you can call it considerable; I have done some correspondence, but I should say very little.

Q.—You have written around to doctors, haven't you, over the country, trying to interest them to come here and testify in this case? A.—Yes, sir.

Q.—Well now, did you do that as research, or as under what employment? Or was that special work? A.—No, that was all in the same group. I should rather change the word "research."

Q.—Well, change it then. A.—I should say that I was paid to prepare the medical end of the case to a certain extent.

Q.—Then it is true that you prepared the medical end of this case? A.—Partly, yes; to a great extent.

Q.—What say? A.—To a great extent.

Q.—In other words, the procuring of witnesses and the consideration of the medical phases of this case, has been under your control and direction largely, has it not? A.—Very largely, yes, sir.

Q.—Now, doctor, you say you have not been practicing medicine for three years? A.—Not general medicine, no.

Q.—Well, what have you been doing during that time? I mean, you say in general practice — not general practice, and I am asking you what you mean by that? A.—I mean that I have been doing nothing but special work, eye work.

Q.—Then, so far as the treatment of disease is concerned, aside from the eye, you have not been engaged in the practice of your profession for three years? A.—No, sir; that is true.

Q.—Did you ever practice your profession? A.—Oh, yes.

Q.—Where? A.—I practiced down in Republic, Ohio, in a —

Q.—How large a place is Republic, Ohio? A.—It is a little country place, about 700 or 800 inhabitants.

Q.—What year were you at Republic, Ohio, or years? A.—I think it was in around 1893, '94 or '95; somewhere around in there.

Q.—Did you practice your profession down there through those three years according to your present recollection? A.—Yes.

Q.—Is that right? A.—Yes.

Q.—Where did you go to from Republic, Ohio? A.—I went to Cleveland, Ohio.

Q.—How long were you in Cleveland? A.—I cannot exactly remember, but I should think until about 1900 — I mean the next ten after that, 1910, somewhere along in there.

Q.—Then you left Republic along in 1895? A.—As far as my recollection goes, yes, sir.

Q.—1895. A.—I am giving the dates as near as I can remember them.

Q.—I don't mean to ask you to say exactly, probably you cannot do that; but give your best recollection. A.—Yes.

Q.—Then you left Republic you think in 1895, and went to Cleveland? A.—Yes, sir.

Q.—You were in Cleveland for 10 years, ten or 15 years? A.—No, I said, the next ten number, the next ten number. I was in Cleveland about five years.

Q.—About five years? A.—Yes, I should say so.

Q.—So that you left Cleveland in about 1900? A.—I think so, yes, sir.

Q.—Did you practice medicine while you were in Cleveland? A.—No, sir.

Q.—What were you doing while you were there? A.—I was engaged in business.

Q.—What kind of business, doctor? A.—Oh, two or three kinds of business; I was just earning money, that is all.

Q.—How were you earning it? A.—I think I worked for a railroad company; I think I worked for a firm of lawyers. I may have worked for somebody else, but I don't remember.

Q.—Don't you know what you did while you were in Cleveland for five years? You say you think you worked for a railroad company? A.—I know I did that.

Q.—Then you say you think you worked for a firm of lawyers? A.—Well, I know that.

Q.—Did you or didn't you? A.—I did, yes; that is true.

Q.—What firm of lawyers did you work for there? A.—Williams, Cushing & Clark, they were in those days. I think they are changed now.

Q.—Did you do anything else during the five years you were there other than work for the railroad company, and Williams, Cushing & Clark? A.—I don't remember that I did.

Q.—If you did, you don't remember it? A.—No, sir.

Q.—But anyhow you know you did not practice any medicine? A.—Oh, I know that; that is certain, I did not practice any medicine.

Q.—Now, while you were down in Republic, Ohio, three years, did you do any practicing there? A.—Oh, yes.

Q.—What? A.—Yes, sir.

Q.—Did you engage altogether during the time you were at Republic, in the practice of your profession? A.—As far as I remember, yes.

Q.—Well, you know you were not doing anything else, don't you? A.—As far as I remember I was not.

Q.—Did you have a pretty good practice there, doctor? *A.*—Oh, yes; pretty good country practice.

Q.—In a town of 700 or 800 inhabitants? *A.*—Yes, and the countryside.

Q.—Yes; you rode around the country some? *A.*—Yes.

Q.—Were you associated with any one in the practice of medicine there? *A.*—No, sir.

Q.—When you left Cleveland, where did you go? *A.*—Came to Chicago.

Q.—What did you do after you came to Chicago? *A.*—I still worked.

Q.—What? *A.*—I still worked.

Q.—What kind of work were you doing, doctor? *A.*—Clerical work.

Q.—Well, you say you were not practicing medicine? *A.*—What?

Q.—You were not practicing medicine? *A.*—I was not practicing medicine, no sir.

Q.—Were you licensed to practice down in the State of Ohio, then? *A.*—If I remember rightly, there was no license required.

THE COURT:—The question is, were you licensed? *A.*—No, sir.

Mr. T. J. Scofield:—I am asking you if you were licensed to practice? *A.*—No.

Q.—You were practicing down in Ohio in 1893, and 1894 and 1895 without any license? *A.*—That is my recollection, yes.

Q.—When you came to Chicago you did clerical work here? *A.*—Yes.

Q.—You did not practice medicine? *A.*—Yes.

Q.—Now, did you continue to do clerical work? How long did you continue that? *A.*—Till about 1904.

Q.—So you were four years doing clerical work? *A.*—Yes.

Q.—And that means you were nine years out of your profession? *A.*—Yes.

Q.—Now, the clerical work which you did here, was it exclusively clerical work, your work? *A.*—I don't know exactly what you mean.

Q.—Well, did you do anything else than clerical work? *A.*—Not that I remember of, no.

Q.—Whom did you work for? *A.*—I worked for the St. Louis, Peoria & Northern Railway, and I worked for a coal company, I think.

Q.—What coal company? *A.*—The Mindink Coal Company.

Q.—What did you do for the railroad company? *A.*—Clerical work, and tariff work.

Q.—In whose office were you? *A.*—In the office of J. N. Faithorn's Son, but I forget his name.

Q.—What else did you do besides those things, after you came to Chicago? *A.*—Nothing that I know of.

Q.—Did you work in the evenings those days? *A.*—I may have, I do not know.

Q.—You don't remember whether you did or not. Commencing in 1904, what did you do? *A.*—Commencing in 1904, I became the editor, I think, that year of the *Medical Standard*.

Q.—The *Medical Standard*? *A.*—Yes.

Q.—Where was it published? *A.*—In Chicago here, on Dearborn Street.

Q.—Did you own it? *A.*—Oh, no.

Q.—Who owned it and operated it? *A.*—George P. Engelhard.

Q.—What kind of a publication was it? *A.*—A medical journal, I don't know how else to describe it.

Q.—Is it in existence at the present time? *A.*—Yes, sir.

Q.—How long did you continue editor of that journal? *A.*—Until 1912.

Q.—Well, did you commence as editor in 1904? *A.*—My recollection is it was 1904.

Q.—Or 1905? *A.*—Yes, sir; 1904 or 1905.

THE COURT:—And you started right in as editor? *A.*—Oh, yes.

Mr. T. J. Scofield:—You started to work as editor right away. *A.*—Yes.

Q.—What medical experience had you had before that warranted your becoming editor of the medical journal at that time?

Mr. Walker:—That is objected to.

THE COURT:—Objection sustained.

To which ruling of the Court the defendants, etc., excepted.

Mr. Walker:—I withdraw the objection.

THE COURT:—You gentlemen will have to settle that among yourselves. Two of you object, and one withdraws it.

Mr. Walker:—I withdraw it, as far as I am concerned.

Mr. T. J. Scofield: *Q.*—Now, doctor, did your work as editor of the journal require all your time? *A.*—No, because I was at that time attending school.

Q.—You were what? *A.*—I was at that time attending school.

Q.—What school did you attend? *A.*—The Chicago College of Medicine and Surgery.

Q.—You graduated there, didn't you? *A.*—Yes, sir.

Q.—When did you graduate there? *A.*—I think in 1905.

Q.—You matriculated in 1905 too, didn't you? *A.*—Yes, sir.

Q.—Now, when you say you matriculated, what do you mean by that? *A.*—Entered the college.

Q.—You were also professor there at that time, were you not, in 1905? *A.*—No, sir.

Q.—What? *A.*—No, sir.

Q.—You were not? *A.*—No, sir.

Q.—Did you graduate the same year you matriculated? *A.*—I did, yes, sir.

Q.—Did you attend lectures there? *A.*—Yes, sir.

Q.—Did you deliver lectures during that year? *A.*—No, sir.

Q.—When did you commence delivering lectures there? *A.*—I think about 1907. I am not sure, it might have been 1906.

Q.—Let us see; the catalogue of that institution for the years 1905 and 1906 represented what part of those two years? *A.*—Well, one catalogue would represent, of course, from the September of 1904 to the spring of 1905, and the other catalogue would represent from the fall of 1905, on until the spring of 1906.

Q.—1905 and 1906? *A.*—Yes, sir.

Q.—Well, you were instructor in physiology, were you not, and so indicated in the catalogue of the American College of Medicine and Surgery in 1905 and '06? *A.*—If the catalogue says so, that is true.

Q.—I am asking you.

THE COURT:—Let the witness see it; it may refresh his memory. [See Footnote 1.]

Mr. T. J. Scofield: *Q.*—I am asking you if it is not a fact, if that is not a fact, and I will hand you this catalogue? *A.*—That seems to be true, yes, sir.

Q.—And that same catalogue shows that you matriculated that year, don't it? *A.*—No, it shows that I graduated that year.

Q.—Doesn't it show that you matriculated and graduated, and isn't that all shown in this catalogue of 1905 and 1906? *A.*—I don't know whether it is or not.

Q.—Well, take it and look it up and see whether or not it is not. *A.*—No, it shows here that I was a matriculant in 1904 and '05 session, which was previous to this.

Q.—When does it show you graduated? *A.*—1905.

Q.—1905? *A.*—Yes.

Q.—Then in 1905 and 1906 you were lecturing on physiology? *A.*—Yes, sir.

Q.—So that if I understand you right now, you practiced medicine down in Republic, Ohio, a little town of 800 or 900 inhabitants, for three years and then you passed out of the practice of medicine in 1905, and did not resume it, and you were engaged then in clerical work of different kinds? *A.*—Yes.

Q.—Until the year 1904 when you matriculated in this institution, and also became the editor of the *Medical Standard* or the *Standard Journal*, is that right? *A.*—Yes, sir.

Q.—You matriculated in 1904-1905 and you graduated in 1905, did you not? *A.*—Yes, sir.

Q.—And in that year you were put down in this catalogue as a lecturer there? *A.*—Yes, sir.

Q.—Now, had you ever practiced medicine before you went to Republic, Ohio? *A.*—No, sir.

Q.—Had you ever taught physiology before you taught it here? *A.*—I don't remember.

Q.—Well now, think for a moment whether you ever did or not. *A.*—I don't remember.

Q.—Had you ever taught physiology before? *A.*—I cannot remember, Mr. Scofield.

THE COURT:—Did you ever teach anywhere before? *A.*—I don't remember now.

Mr. T. J. Scofield: *Q.*—You don't remember? *A.*—I don't remember, no.

Q.—Well now, when you teach physiology — I don't distinguish between lecturing and instructing — did you ever lecture or were you ever an instructor in physiology anywhere? *A.*—I don't remember ever being.

Q.—If you ever have been, you would have remembered that fact, wouldn't you? *A.*—I don't know whether I would.

Q.—Why doctor, were you not an instructor in physiology in St. Mary's Hospital College of London, England? *A.*—I believe I did do some instructing in St. Mary's.

Q.—You believe you did? *A.*—Yes, sir.

Q.—Is that such an insignificant thing that you had forgotten about it? *A.*—The kind of instructing I did over there would certainly be rather insignificant, yes.

Q.—Is it not true that you were not instructor over there at all? *A.*—It is not true, no sir.

Q.—How is that? *A.*—It is not true, no sir.

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1. The witness was then handed the Annual Announcement of the American College of Medicine and Surgery published in 1905. This announcement contained Atkinson's name as a member of the faculty, as a matriculant for 1904-1905 and as a graduate of 1904-1905. These items are here photographically reproduced in miniature:

THOMAS GEORGE ATKINSON, L. R. C. P. (Lond.), M. D.,
355 Dearborn Street Chicago
Instructor in Physiology. *Late Instructor in Physiology St. Mary's Hospital College, London.*

Graduates of 1904 and 1905.

Atkinson, Thomas G.

Matriculants 1904 and 1905.

Ackermann, Susan K. ..... Norway
Alstrom, Ernest, ... Illinois
Armstrong, C. H. ..... Nebraska
Andres, R. G. ..... Wisconsin
Arnold, S. G. ..... Illinois
Atkinson, T. G. ..... London

Q.—How long since you have remembered that you might have been an instructor over there at that institution, in London, England? *A.*—I don't understand your question.

Q.—I asked you if you had been an instructor in physiology, and you said you did not know whether you ever had before, until you commenced as an instructor here. You said you did not remember whether you had or not. *A.*—Yes.

Q.—Now then, you say you believe maybe you did do some instructing in London? *A.*—Yes.

Q.—You knew that when you were an instructor over here didn't you, at this American College of Medicine and Surgery? *A.*—Perhaps I did.

Q.—You did, and you told them about it and it was put down in the catalogue. Didn't you see that when I handed that to you? *A.*—No, I did not notice it.

Q.—With that marked on the side? *A.*—No, sir; I just looked and saw my name.

Q.—Now it comes back to you, that you did at one time act as instructor in St. Mary's College Hospital, over in London, England, in physiology? *A.*—Yes, sir.

Q.—So that when you said a while ago that you had never been an instructor in physiology, until you became an instructor here, in this institution, you were mistaken, were you?

Mr. Walker:—That is objected to.

THE COURT:—He said he did not remember having been one elsewhere.

Mr. T. J. Scofield: Q.—Now then, doctor, I hand you a letter here [see Footnote 2], and ask you to look at it, and see if you recognize any of the signatures there, or the letterhead and tell me whether or not the matter that is stated in that letter is true or untrue?

Mr. Walker:—That is objected to.

A.—I do not recognize it, and I do not know whether it is true or untrue. I do not recognize the name or the letterhead at all.

Mr. T. J. Scofield:—You read the body of this letter?

Mr. Walker:—That is objected to as immaterial.

THE COURT:—He may answer.

To which ruling of the Court the plaintiff, etc., excepted.

A.—Yes.

Mr. T. J. Scofield: Q.—You read it, but you don't know whether it is true or untrue? *A.*—No, I do not.

Mr. Hough:—Let me see the letter.

THE COURT:—You had better have it identified by the reporter.

(The paper is marked Defendants' Exhibit A, 6-6-16).

Mr. T. J. Scofield:—I will ask you now, if it is not true, doctor—do you want to see it Mr. Hough?

Mr. Walker:—Not at all, I don't care anything about it.

THE COURT:—Under our local law in Illinois, it might be—

Mr. Walker:—It might be admissible now, because Hough looked at it, I know.

Mr. T. J. Scofield: Q.—Now, doctor, after looking at that letter, which I just showed you, does that refresh your memory in any way, shape or form?

Mr. Walker:—On what?

Mr. T. J. Scofield:—As to anything. As to any experience which you had in London.

Mr. Walker:—World without end, Amen.

A.—No, it does not.

Mr. T. J. Scofield:—Now, if the Court please, let us abstain from any such remarks. I think we had better conduct this case properly.

THE COURT:—Yes, I think the objection was not in proper form, so that it will be overruled.

Mr. T. J. Scofield: Q.—Now then, doctor, I will ask you this question: After having looked at this letter does it refresh your recollection in any way as to whether or not you ever at any time taught physiology in St. Mary's Hospital Medical School in London?

Mr. Walker:—Mr. Hough made an objection, and I second it; it is immaterial, irrelevant and incompetent.

THE COURT:—He may answer.

To which ruling of the Court the plaintiff, etc., excepted.

A.—No, it has no effect on my memory at all.

THE COURT: *Q.*—Were you ever on the official staff of instructors at St. Mary's? *A.*—No, sir.

Q.—Were you ever paid for instructing? *A.*—No, sir; whatever instructing I did, was simply done in an informal way. I never was on the board or list of instructors at all.

Q.—That is, some other student asked you to help him? *A.*—Well, more than that; I did a little informal instructing.

Q.—As a tutor? *A.*—Yes.

Q.—Tutoring other boys that were studying there? *A.*—Exactly.

Mr. T. J. Scofield:—Well then, doctor, when you had placed in this catalogue of the American College of Medicine and Surgery, "Thomas G. Atkinson, L.R.C.P. London, Instructor in Physiology, Late Instructor Physiology, St. Mary's Hospital College, London," did you mean to put there— *A.*—I did not write that catalogue, Mr. Scofield, and I am not responsible for it.

Q.—Did you furnish your own qualifications?

Mr. Walker:—That is objected to as immaterial.

THE COURT: *Q.*—You knew that was in the book? *A.*—Yes, I knew it was in the book, but I could not help it being in the book.

THE COURT:—You did not disclaim it?

Mr. T. J. Scofield: Q.—How did you find out it was there, doctor?

Mr. Walker:—That is objected to as immaterial.

Mr. T. J. Scofield: Q.—Did you ever see it there?

Mr. Walker:—That is objected to.

THE COURT: *Q.*—Did you give the editor of the book the information on which that statement was made? *A.*—I gave the man who got out that book the same information that I am now giving in court on the subject, and he put it in.

Q.—Did it take me as long to get it as it did him? *A.*—No.

Mr. T. J. Scofield: Q.—Is it also the same way in the subsequent catalogue of that school? *A.*—I do not know; probably it is.

Q.—Now, doctor, what did you say about your graduation in medicine, your first and original graduation? *A.*—I said that I attended St. Bartholomew's and St. Mary's and obtained a license from the Royal College of Physicians.

Q.—When you say that, you mean that you are a licentiate of that college? *A.*—Yes, sir.

Q.—Have you a certificate showing that fact? *A.*—No, sir.

Q.—Doctor, I hand you here the Medical Register of the Licentiates of that institution, edition of 1916, and ask you to point out your name in that book as a licentiate of that institution.

Mr. Walker:—That is objected to. We do not know anything about what the book is, it is not authenticated, and we know nothing about it.

THE COURT:—Objection sustained.

To which ruling of the Court the defendants, etc., excepted.

Mr. T. J. Scofield: Q.—What is that book that you hold in your hand?

Mr. Walker:—That is objected to. So far as it goes, it shows for itself.

A.—I don't know.

Mr. Walker:—If it is competent to show anything.

Mr. T. J. Scofield: Q.—Do you know what the Medical Register is? *A.*—Yes, I know what it is.

Q.—What is the Medical Register?

Mr. Walker:—That is objected to.

THE COURT:—He may answer if he knows.

To which ruling of the Court the plaintiff, etc., excepted.

A.—It is a list of physicians who are registered and practicing in the place.

Mr. Walker:—Louder.

A.—It is a list of men, graduates who are registered and practicing in the place.

THE COURT:—What does that registration consist of? After you once are licensed, do you have to register before you get into the list? *A.*—You need not. It is not necessary that one should be registered at all. For my part I left England immediately after I graduated, and therefore it is quite likely that my name is not in any register there.

Mr. T. J. Scofield: Q.—You don't contend that you are classed here in this register as a licentiate? *A.*—No, sir.

Mr. Walker:—That is objected to.

THE COURT:—The witness takes different methods. He pauses for me to rule as to some questions, and he answers in spite of the objection, as to others.

Mr. Walker:—I did not hear that there was an answer to this last question.

THE COURT:—Yes, there was an answer.

Mr. Walker:—Well, let it stay there then; I did not know it was in.

Mr. T. J. Scofield: Q.—Doctor, I will ask you whether or not it is not true—if you know whether or not it is true that the book that I have just shown you, or the Medical Register, is published under an Act of Parliament?

Mr. Walker:—That is objected to.

THE COURT:—Sustained; what difference does it make, what the witness knows about it.

Mr. T. J. Scofield:—Well, if he knows, and that is true, I do not understand why it would not be competent.

THE COURT:—What difference does it make whether he knows it is true or not; that is my proposition.

Mr. T. J. Scofield:—I don't see why it would not be competent, if it is competent for any purpose.

THE COURT:—It is competent in spite of what the witness knows, if it is competent for any purpose. What did your license consist of? Did you get any writing or any diploma?

A.—Yes, sir.

Q.—What was the nature of it? *A.*—I had a certificate.

2. The letter handed the witness was from the secretary of "St. Mary's Hospital Medical School (University of London)," and read: "*Dear Sir*:—In reply to your letter of the 19th inst. I beg to inform you that the name of Thomas G. Atkinson does not appear upon the roll of Lecturers on Physiology who have held office at this school."

Q.—What? *A.*—Yes, sir; I got a certificate from them which I lost and never replaced.

Mr. T. J. Scofield: Q.—I don't know whether I understood you doctor. Did you say you had a certificate? *A.*—No, I did not say—

THE COURT:—Which he lost.

Mr. Walker:—And which he never replaced.

Mr. T. J. Scofield: Q.—And it was never replaced? *A.*—No, sir.

Q.—So that you have no evidence of the fact that you are a licentiate of that institution? *A.*—I have none about me, no.

Q.—I will hand you a letter, doctor, which I will first have the reporter mark Defendants' Exhibit B of this date, and ask you to read it. [See Footnote 3.]

Mr. Walker:—I object to it.

THE COURT:—Objection overruled. Not out loud, though, read it to yourself.

To which ruling of the Court the plaintiff, etc., excepted.

A.—I have read it.

Mr. T. J. Scofield: Q.—Did you read the signature on the back? Look at it. *A.*—Yes, sir.

Q.—Do you recognize that signature? *A.*—No, sir.

THE COURT:—What is the answer? *A.*—No, sir.

Mr. T. J. Scofield: Q.—Now, doctor, having read this letter which I submitted to you, do the contents of this letter refresh your recollection in any way as to whether or not you are a licentiate of this institution?

Mr. Walker:—That is objected to.

THE COURT:—He may answer.

To which ruling of the Court the plaintiff, etc., excepted.

A.—No, sir.

Mr. T. J. Scofield: Q.—It does not? *A.*—No, sir.

Q.—Are you a licentiate of that college? *A.*—Yes, sir.

Q.—For what year? *A.*—'92.

Q.—1892? *A.*—Yes, sir.

Q.—You came then pretty nearly, or very soon after that to Republic, Ohio? *A.*—Yes, sir; almost immediately.

Q.—You never practiced any in London? *A.*—No, sir.

Q.—How long was it after you became a licentiate, as you say, that you left England? *A.*—I left England the same year, in 1892. I left Europe about a year after.

Q.—What year were you born, Doctor? *A.*—1870.

Q.—Did you ever graduate at any other institution in London? *A.*—Only, as I stated. I matriculated, and took what is known as the Intermediate Bachelor of Science at London University. There are two Bachelors of Science given at London, intermediate and final.

Q.—What year did you study there? *A.*—You don't study at the London University. London University is simply an examining body, or was in those days.

Q.—When was it that you took this degree of Bachelor of Science? *A.*—I think in 1886 or '87.

Q.—Have you the certificate? *A.*—No, I have not got that any more.

Q.—What became of that, did you lose that, too? *A.*—It may be at home, if I look it up, I don't know.

Q.—What did you do, did you matriculate merely? *A.*—No, I took the intermediate examination.

Q.—What? *A.*—No, I took the intermediate examination.

Q.—So you did not attend at all? *A.*—No.

Q.—You just simply took the examination? *A.*—No, I did not attend at all.

Q.—You made application, didn't you, for the examination to take the degree of Bachelor of Science? *A.*—I presume I did, I don't remember any more what the detail of the routine is.

Q.—When was that, in 1888 or when? *A.*—No, it was before that, about 1887.

Q.—Now, doctor, coming down to the year 1904 and 1905, you say you continued to be the editor of the *Standard* journal until that time? *A.*—Until 1912.

Q.—What else were you doing besides acting as editor of that journal? *A.*—Teaching and practicing medicine.

Q.—Well, where did you practice medicine? *A.*—Well, now, let me think. My recollection is that I had my office in the same place where I had the journal, where I edited my journal.

Q.—Where was that, Doctor? *A.*—On Dearborn Street in those days, in the Ellsworth Building.

Q.—Did you have an office anywhere else? *A.*—I don't think so.

Q.—How long did your office continue there? *A.*—Up until the time I went to St. Louis. I went to St. Louis in 1910.

Q.—Did you still continue to do editing of this journal here? *A.*—Yes, sir.

Q.—For two years? *A.*—Yes, sir.

Q.—Did you come to its editorial office every day here in Chicago? *A.*—Yes, sir.

Q.—What hours did you keep there, all day long? *A.*—Practically, yes.

Q.—Clear up to the year 1910? *A.*—Yes, sir.

Q.—Except such time as you say you were teaching? *A.*—Yes, sir.

Q.—When you went to St. Louis, what did you do? *A.*—Edited the *Medical Brief*, taught in school, and took care of a great deal of clinical work.

Q.—You were not in the practice of medicine, were you? *A.*—Why, not for the first two years—no, I don't think I ever was in St. Louis, not in private practice, no.

Q.—That is what I mean, in St. Louis? *A.*—No, sir.

Q.—What school were you in there? *A.*—The American Medical College.

Q.—What did you teach there? *A.*—I taught neurology and physiology.

Q.—What is neurology? *A.*—Diseases of the nervous system.

Q.—Did you attend any clinics there? *A.*—Oh, yes.

Q.—What kind of diseases? *A.*—Diseases—nervous diseases.

Q.—Nervous diseases? *A.*—Yes, sir.

Q.—Nervous and mental? *A.*—Yes.

Q.—Did you attend any other class of clinics? *A.*—No.

Q.—That was the character of clinics that you attended? *A.*—Yes, sir.

Mr. Walker:—You are speaking of St. Louis now?

Mr. T. J. Scofield:—What?

Mr. Walker:—That is, at St. Louis?

Mr. T. J. Scofield:—At St. Louis, yes.

Q.—Did you make a specialty of neurology? *A.*—I did in the clinics, yes.

Q.—How long did you continue to specialize in mental and nervous troubles? *A.*—Until I came back from St. Louis in 1912.

Q.—When was that? *A.*—1912.

Q.—When you came back from St. Louis, what did you do? *A.*—Then I began to limit myself to the eye.

Q.—Then you commenced to— *A.*—Then I began to confine myself to the eye.

Q.—What experience had you had in the study of the eye, any special work? *A.*—Yes, one gets a great deal of special study in the eye, during his study of nervous diseases, that is what led me into it.

Q.—So that you then became an eye specialist, did you? *A.*—Oh, I confine myself to the eye.

Q.—You confine yourself to that? *A.*—Yes, sir.

Q.—That was commencing in 1913? *A.*—About 1912.

Q.—You have confined yourself to that specialty since, have you? *A.*—Yes, sir.

Q.—For the last four years? *A.*—Yes, sir.

Q.—Three years ago you dropped out entirely of the general practice of medicine? *A.*—Yes, sir.

Q.—That was in 1913? *A.*—Yes, sir.

Q.—So that after you came back from St. Louis in 1912, you commenced to give attention to the eye, and in 1913, you quit making any pretense to practice medicine, and confined yourself to the eye? *A.*—That is right.

Q.—Now, doctor, you have mentioned, I suppose, the different institutions that you have been connected with, have you? *A.*—I mentioned the medical institutions I have been connected with, yes.

Q.—Were you connected with any other institutions? Before we pass away from that, you have detailed your experience as a practitioner of medicine now, have you? *A.*—Yes.

Q.—In neurology and all that? *A.*—I believe I have, yes.

Q.—All right. Now, what other institutions have you been connected with for the last two or three years? *A.*—What kind of institutions do you mean?

Q.—Well, I mean along the line of your work, any kind. You say you have been studying nervous conditions, and paid attention especially to the eye. *A.*—I am now connected with the School of Refraction.

Q.—By School of Refraction, what do you mean? *A.*—I mean that I teach the fitting of glasses, the refraction of the eye, and the fitting of glasses.

Q.—In other words, you are teaching the young or students how to fit spectacles and glasses? *A.*—Fit glasses, yes, sir.

Q.—Well, Dr. Von Zielinski is one of the professors in that institution, isn't he? *A.*—Yes.

Q.—Is Dr. Funck connected with it in any way? *A.*—No, sir.

Q.—Now, you teach students how to fit eye glasses by mail, correspondence, don't you? *A.*—Oh, no.

Q.—Not at all? *A.*—No, sir.

Q.—You have no correspondence work at all? *A.*—Yes, I have correspondence work which teaches the theoretical—

THE COURT:—You do your teaching perhaps by mail, but you don't teach them to fit glasses by mail; they don't fit glasses by mail. Your question was ambiguous.

The Witness:—That is not exactly true, either, your Honor.

Mr. T. J. Scofield: Q.—What is the fact, then, doctor? *A.*—The fact is that I teach that part of refraction, which can be taught by mail, by mail.

Q.—What part is that doctor? *A.*—Oh, the physics and mathematics can be taught by mail.

Q.—That is about all there is to the fitting of glasses, the question of refraction and mathematics? *A.*—That is all there is to theoretical optometry, and that is what I teach by mail.

Q.—So that that part of it, the figuring out the lenses, and the condition of the eye, and what is needed to correct it, you teach by mail? *A.*—I teach the mathematics and physics of it by mail. I may say, however, in passing that it has been shown me by practical experience, that it is not practicable, and we have abandoned that altogether.

Q.—So that you have finally come to the conclusion that the statement you made a while ago that such things could be taught by mail,

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3. The letter handed the witness was from the secretary of the "Medical Defence Union" of London, and read in part: "*Dear Sir*:—I have been making further enquiries re Atkinson and find that Thomas George Atkinson is not, and never has been, L.R.C.P.Lond., and further, that an exhaustive search has been made by the Authorities at St. Mary's Hospital Medical School, and no trace can be discovered of this person ever having been either Teacher or Student."

was an error? *A.*—No, it is other practical obstacles that have come in my way, not that. I still think that it can be taught by mail, so far as possibly the teaching of it is concerned.

Q.—When did you abandon that way of teaching? *A.*—Well, a month or so ago, I should say, three or four weeks ago.

Q.—Since this suit has been started? *A.*—Quite a long while after it, yes.

Q.—You were still teaching it as late as January, 1916, by mail, were you not? *A.*—Oh, yes, we were teaching that part of it by mail, yes, sir.

Q.—You are still teaching it are you not, by mail, to some extent? *A.*—I do not think we have got a single student. Of course we had to arrange for the shutting off of those that were already on a correspondence course, but I do not think there is one student left on that. There may be, but I do not think so.

Q.—Doctor, you are the same Dr. Atkinson, are you not, who was employed by Mr. Fletcher Dobyns of this city in the defense of the Jiroch Medical Company case, which was on trial before Judge Landis here a few weeks or months ago? *A.*—I was retained by him, but I cannot say that I was ever employed by him.

Q.—You were retained by him? *A.*—Yes, sir, I was retained by him.

Q.—And you consulted with him, didn't you? *A.*—I think I did, yes.

Q.—You were paid money by him, were you not? *A.*—Yes. When I said I was not employed, I meant that we never went into court, because the case never reached court.

Q.—That is, it never reached your part of it? *A.*—Yes, that is what I mean, exactly.

Q.—But you were employed in the Jiroch Medical Case before Judge Landis? *A.*—Oh, yes.

Q.—And you received pay for it? *A.*—Yes.

Q.—Now, just a few questions which I wish to ask you. Did you ever treat a case of gonorrhea? *A.*—Oh, yes.

Q.—How many cases did you treat, do you think? *A.*—Oh, not very many, of course, but what falls to the ordinary lot of the practitioner.

Q.—Now, then, in the treatment of gonorrhea, did you advise your patients to abstain from the use of alcohol? *A.*—As a beverage, yes.

Q.—Did you advise them to cut out wine and beer, and spirituous liquors generally? *A.*—Yes, sir.

Q.—Why did you give them that advice, doctor? *A.*—Because, in large quantities, I do not think that alcohol is a good thing for a gonorrheal patient.

Q.—Doctor, do you believe that there are medicines, which, if applied locally, will destroy the gonococcus? *A.*—That is a question I do not feel competent to express an opinion about, but I will say that I believe there are drugs, which, applied locally, at least render them harmless, inhibit them.

Q.—Well, you have used that sort of medicine in the treatment of gonorrhea, haven't you? *A.*—Oh, yes.

Q.—Do you think that gonorrhea, in a healthy individual, is a self limiting disease?

Mr. Walker:—I am going to make this objection. I did not ask this witness anything about gonorrhea at any time. If this is to test his knowledge, that is another thing. But I did not ask this witness a single thing about gonorrhea.

THE COURT:—It is not cross-examination.

Mr. T. J. Scofield:—Oh, yes, your Honor.

Mr. Walker:—I did not ask him one thing, your Honor, about that.

THE COURT:—As a matter of fact it is not.

Mr. T. J. Scofield:—What say?

THE COURT:—I say, it is not cross-examination. You are asking this witness to contradict what some other witness has said.

Mr. T. J. Scofield:—Oh, no, in his examination, he called attention—he asked the doctor about vaginitis.

Mr. Walker:—Yes, but I did not ask anything about gonorrhea.

Mr. T. J. Scofield:—And the various causes for it, and one of the common causes—

THE COURT:—I think the word "gonorrheal" was not mentioned.

Mr. Walker:—I never asked him anything about it at all.

Mr. T. J. Scofield:—I do not think it was either, but the subject which he introduced had relation to the subject which was discussed in the Home Treatment Book for Women, and the advice which was given in the treatment of gonorrheal vaginitis.

Mr. Walker:—Not at all. I did not ask him anything about gonorrheal vaginitis.

THE COURT:—No.

To which ruling of the Court the defendants, etc., excepted.

Mr. T. J. Scofield: Q.—Is vaginitis ever caused by gonorrhea, doctor? *A.*—Yes, sir.

Q.—Well, is that form of vaginitis, or of gonorrhea, is it one which is self limiting, if a person is otherwise healthy?

Mr. Walker:—That is objected to.

THE COURT:—He may answer.

To which ruling of the Court the plaintiff, etc., excepted.

A.—I think that that is pretty hard to answer. In the main, of course, gonorrhea, in my opinion, is a self limited disease, but—

Mr. T. J. Scofield: Q.—What do you mean by that?

Mr. Walker:—Let him finish; he has not finished.

Mr. T. J. Scofield:—All right.

The Witness:—I mean that if it is let alone, the gonococcal part of it any way will disappear.

Q.—Well, now, you say in the main. What do you mean by that, you mean that in sometimes true, and sometimes not? *A.*—That is just exactly what I was going to explain. I say, in the main, it is self limited, but there may be forms of gonorrhea, which by anatomical and pathological reasons tend to perpetuate themselves and become very chronic.

Q.—And extend upward, do they not, also? *A.*—Yes, sir.

Q.—Sometimes, I suppose, it gets around in the ureter and in the bladder, and then sometimes up through the womb and into the fallopian tubes and ovaries? *A.*—Yes, sir.

Mr. Walker:—This is objected to. What is this? A test of his medical knowledge or what. I did not ask him anything about those subjects.

THE COURT:—He has a right to test his medical knowledge. He is an expert here, and was put on for that purpose.

Mr. Walker:—I did not put him on as an expert on gonorrhea, and I did not ask about it.

To which ruling of the Court the plaintiff, etc., excepted.

Mr. T. J. Scofield: Q.—Now, doctor, inflammations of the vagina, and of the fallopian tubes, and of the uterus, and of the ovaries are sometimes gonorrheal, are they not? *A.*—Inflammation of those parts?

Q.—Yes? *A.*—Yes, sir.

Q.—Comes from gonorrhea, doesn't it? *A.*—Yes, sir.

Q.—Now, in your opinion, which you expressed this morning that this medicine, which Mr. Walker called your attention to specifically as Wine of Cardui—did you mean to be understood that in your opinion that sort of medicine would be good for a woman who was suffering from gonorrheal salpingitis? *A.*—No, I did not say so.

Q.—You did not mean that then? *A.*—No, sir.

Q.—Nor you did not mean, I suppose, that it would be good for gonorrheal inflammation of the womb, either? *A.*—No, sir.

Q.—Nor endometritis, or metritis, gonorrheal? *A.*—Oh, I don't know, I think perhaps it would be good for those.

Q.—You think that it may be good, do you? *A.*—Yes, sir.

Q.—For endometritis or metritis? *A.*—Yes.

A.—But not for salpingitis, or ovaritis or anything of that sort? *A.*—Not a gonorrheal salpingitis, no sir.

Q.—Now, doctor, vaginitis or gonorrheal vaginitis, would you think such a medicine as that would cure gonorrheal vaginitis? *A.*—I don't think any medicine cures it.

Q.—Now, doctor, taking up the question of viburnum prunifolium, you said something about that this morning. What are the potent qualities that viburnum prunifolium contains? *A.*—I cannot tell you.

Q.—You don't know what they are? *A.*—No.

Q.—What are the potent qualities found in cnicus benedictus that gives it its medicinal value, if it has any? *A.*—I cannot tell that. Both in viburnum and in carduus, I can tell one or two things that have been suggested as being—

Q.—I am not asking that. I am asking if you know. *A.*—No, I do not.

Q.—What the potent element is in either? *A.*—I do not.

Q.—In either of these herbs, if they contain potent elements? *A.*—Frankly, I don't know.

Q.—You never used any cnicus, did you? *A.*—No, sir.

Q.—In your life? *A.*—No, sir.

Q.—Now, doctor, in the hypothetical medicine described to you by Mr. Walker, which contained both viburnum prunifolium, and carduus benedictus, did you, in considering and in answering his question, consider both carduus benedictus and viburnum prunifolium as being of value in that medicine in the dosage mentioned? *A.*—Yes, sir.

Q.—Do you think now, that on account of the synergistic action of those two drugs, that this combination would have a greater effect than it would have if either of them were omitted? *A.*—Yes, I do.

Q.—Do you think that the solution, described by Mr. Walker and which he said was in a 20 per cent. alcoholic menstruum, or solution, would be just as valuable if the viburnum prunifolium was omitted? *A.*—No, I don't think it would.

Q.—Do you think that that solution would be just as valuable in the same percentage of alcohol if the carduus was omitted? *A.*—No, I don't think it would.

Q.—You do not then, if I understand you right, think that that medicine, if it was effective at all, would be as effective if the viburnum prunifolium was left out? *A.*—No, sir.

Q.—And you don't think that that medicine would be as effective, if effective at all, if the carduus benedictus was left out and the viburnum prunifolium was left in? *A.*—No, sir.

Q.—In your judgment, in order to be effective, if effective, it takes the combination of the two?

Mr. Hough:—We object to that. That is not what the witness says.

Mr. T. J. Scofield:—Is that right, Doctor?

THE COURT:—That is in the form of a question.

The Witness:—I can answer.

THE COURT:—He may answer.

To which ruling of the Court the plaintiff, etc., excepted.

The Witness:—No, I did not mean that at all, but I think that the two together are more effective than either would be by itself. I don't mean if they were separate then they would not be effective at all; but they would not be as effective if one was taken out and the other left, as they are both together.

Mr. T. J. Scofield: Q.—Now, you said that you had used the fluidextract of viburnum? A.—Yes, sir.

Q.—That is the form you use it in your practice— A.—Mostly, yes, sir.

Q.—Where you use it at all; is that right? A.—Yes, sir; that is right.

Q.—What is the official dose of that, Doctor? A.—I believe it is somewhere from 30 to 60 drops.

Q.—Yes. That represents practically the same number of grains; does it? A.—The extractives of those grains, yes.

Q.—Yes? A.—The medicinal effect of those grains, yes.

Q.—Yes. Well, now, Doctor, assume that it is a fact that many women had used this solution, Wine of Cardui, both before and after viburnum was added, and had reported the same effects; would this change your mind in any way on the subject of the omission of either of these herbs from that solution?

Mr. Walker:—Objected to.

THE COURT:—Have we had any evidence along those lines? I don't recall.

Mr. T. J. Scofield:—Oh, yes.

Mr. Loesch:—Plenty of it.

Mr. Walker:—Where?

Mr. T. J. Scofield:—Running all through these depositions.

THE COURT:—Go ahead.

To which ruling of the Court the plaintiff, etc., excepted.

The Witness:—Will you read the question again, so I can get the sense of it?

Mr. T. J. Scofield:—I say, assume it is a fact—well, let the reporter read it; let the reporter read it.

(Question read as follows: "Q.—Well, now, Doctor, assume that it is a fact that many women had used this solution, Wine of Cardui, both before and after viburnum was added, and had reported the same effects; would this change your mind in any way on the subject of the omission of either of these herbs from that solution?").

The Witness:—No, I don't think it would.

June 7, 1916, Morning

The Court met pursuant to adjournment. Attorneys for the plaintiff—The Chattanooga Medicine Co.—offered in evidence a letter sent by the secretaries of various state medical societies to their members, enclosing a copy of a letter from Dr. Heizer, and requesting information regarding the use of Wine of Cardui. There was next offered in evidence an advertisement which appeared in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION for Nov. 20, 1915, the advertisement being that of a medical firm which manufactures a preparation of carduus benedictus. The advertisement states that this firm will not "supply any but products of the highest standard and unquestioned therapeutic virtue."

There was then offered in evidence the deposition of Mrs. Lydia Powell, mentioned in the article published in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION for April 11.

There was then offered in evidence a Query and Minor Note published in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, May 27, 1911, referring to the limitations of tablet dealers to the effect that it is not sensible to put volatile substances in pills and tablets and expect the full amount to remain.

TESTIMONY OF DR. CHARLES E. CASPARI

Dr. Charles E. Caspari was called as a witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. HOUGH

Dr. Caspari testified that he is a chemist, residing in St. Louis. He received the degree of Bachelor of Arts in the Johns Hopkins University, in 1896, and the degree of Doctor of Philosophy and Chemistry in 1900, at the same university. He taught in 1900 in the Columbia University for one year. He then went to St. Louis as research chemist in organic chemistry for the Mallinckrodt Chemical Co. for two years. He then became professor of chemistry in the St. Louis College of Pharmacy, which position he has held ever since. For the past twelve years he has been chemist for the Marlborough Drug Co., St. Louis, and for the J. S. Merrill Drug Co., St. Louis, and has done considerable work in food and drug analysis.

Q.—Are you a member of any societies, chemical or medical? A.—Yes, I am a member of the American Chemical Society, one of the co-editors of one of the journals of the society, the *Journal of Engineering and Industrial Chemistry*. I am a member of the American Pharmaceutical Association. I am a Fellow of the American Association for the Advancement of Science. I am a member of the St. Louis Academy of Science; a member of the Revision Committee of the Pharmacopeia, and in that connection, I am a member of four subcommittees of the Revision Committee, namely, those on organic chemicals, inorganic chemicals, drug assays, and essential oils.

Q.—Of which Revision Committee? A.—The Revision Committee of the Pharmacopeia, which is at present pending, and which will appear in a few months.

Q.—How long has the work of that Revision Committee been going on? A.—It has been going on since May, 1910.

Q.—What Pharmacopeia is that? A.—That is the United States Pharmacopeia, the 9th revision.

Q.—What is a Pharmacopeia, doctor? A.—A Pharmacopeia is a collection—or consists of descriptions, of classes of drugs and chemicals and medicinal preparations, which are made from those, together with their properties, their physical and chemical properties, methods of determining their strength and methods for standardizing them.

Q.—What is the National Formulary? A.—The National Formulary is somewhat similar in its character to the Pharmacopeia. It is a book which is owned and published by the American Pharmaceutical Association, and also contains drugs and chemicals which are used perhaps not so extensively as those embraced in the pharmacopeia, but which are, nevertheless, in use and deserving of standardization.

Q.—What is a dispensatory, and what relation does it bear to the Pharmacopeia, and the National Formulary? A.—A dispensatory is a commentary on the Pharmacopeia in that it comments on all the drugs and chemicals that are official in the Pharmacopeia, and in the National Formulary as well, but it even goes further and includes a number of drugs and chemicals which are not contained in the Pharmacopeia, but which are nevertheless of sufficient value to be used. The dispensatory further indicates the therapeutic action and uses of drugs and chemicals which are not contained in the Pharmacopeia or National Formulary.

Q.—When you say "or sufficient value to be used," what do you mean? A.—I mean to be used by the medical profession in this country.

Q.—You mean of therapeutic value? A.—Of therapeutic value, of course.

Dr. Caspari stated that the doses in the Pharmacopeia are average doses. He defined fluidextracts and tinctures, stating that the solvent or menstruum is alcohol, in a greater or less dilution. He stated that the hypothetical medicine described by Mr. Scofield would correspond to a tincture. He stated that the chemist's report of Wine of Cardui published in THE JOURNAL for April 11, 1914, is not a chemical analysis because it is not sufficiently complete. He would call it, as it is properly called, a chemist's report. He stated there are other classes of active drug principles other than those stated in the report. He said that none of the chemist's reports given by the witness for the defendant gave the percentage of the ingredients to total 100. He also stated that chemistry does not indicate the therapeutic value of any drug.

The witness analyzed several samples of Wine of Cardui and found from three and three tenths to three and one half per cent. of extractive matter. He was asked two questions comparing the material contained in Wine of Cardui with other drugs in the Pharmacopeia. Objections to both questions were made and sustained.

Dr. Caspari stated that he found 19½ to 20 per cent. of alcohol by volume in Wine of Cardui. He analyzed ten different samples of carduus benedictus. The maximum alcohol was 44.2 per cent. by volume, and the minimum was 29.6 by volume. The maximum extractive was 24.06 per cent., and the minimum extractive was 7.43 per cent. He stated that had they been transferred into tinctures they would all contain more alcohol than Wine of Cardui. The extractive matter would be about the same or less than is contained in Wine of Cardui. The witness was asked if one of those samples was made by the aforementioned pharmaceutical firm. Objection was made and sustained against any answer.

The witness stated that it has been attempted to use glycerin as a preservative and as an extractive menstruum, but unsuccessfully.

Mr. Hough: Q.—What are the objections from a pharmaceutical point of view? A.—Glycerin extracts too much inert material together with the valuable material from the drug, inert material, such as starch and gums, and dextrin and upon standing these liquid preparations will gradually begin to deposit this inert material, and continue to deposit it for a long time, so that a very turbid and muggy looking extract results and while it is true that glycerin itself can be used for preservative purposes, it cannot successfully be used as

an extractive solvent. There are a few cases where glycerin, together with alcohol, is used as an extracting solvent.

THE COURT: *Q.*—Could you use—this may illustrate the ignorance of the Court—but could you extract the active principles by some other menstruum, and then preserve them after extracting them, in glycerin? *A.*—That has also been tried in the case of acetic acid, but has been found to be unsatisfactory.

Mr. Hough: Q.—Doctor, if you know, state what objections there would be to a preparation of the extractive matter in Wine of Cardui, in the form of pills and tablets? *A.*—There are several objections to the use of the extractive matter from Wine of Cardui for making pills and tablets.

In the first place, in order to obtain the extractive matter, it must be extracted from the drug with a liquid solvent and this solvent then has to be evaporated off in order to obtain the solid residue which is then incorporated into the pills or tablets.

Now, the evaporation of the solvent produces a serious change in the material extracted from the drug; whether that evaporation be carried on at a high temperature (such as the temperature of boiling water or whether it be carried on at lower temperature, the solid residue, standing, undergoes deterioration.

Furthermore, the solid material from the evaporation of Wine of Cardui is very hydroscopic, which means that it takes up moisture very rapidly from the air, absorbs it and remains soft and soggy and that militates against the use of these substances in the form of pills and tablets.

Mr. Hough:—(Addressing counsel for defendants.) Will you let me have your samples, please, that you introduced in evidence of pills and tablets?

Q.—May heat affect the substance contained in Wine of Cardui? *A.*—Heat positively does affect those substances, because Wine of Cardui ordinarily has a distinctive bitter taste, whereas if it is heated for any length of time at all, this bitter taste almost disappears entirely, showing that the heating has produced some change, some decomposition change in the substance, destroying that particular individual substance, which is responsible for the bitter taste.

Q.—Wine of Cardui, if evaporated to dryness, is the residue soluble in water? *A.*—The residue is not completely soluble in water, no.

Q.—Is everything that is in Wine of Cardui soluble in 20 per cent. alcohol? *A.*—It is.

The witness examined the exhibits introduced by the defendant, seven of which he stated illustrated the criticisms he made against the use of the solid material from Wine of Cardui in pill and tablet form. He was shown two samples containing glycerin. He stated that there was no odor to the samples and that none of them smelled like Wine of Cardui. It was impossible for him to tell whether they smelled like carduus benedictus or viburnum prunifolium because these drugs have no odor. The extractives have no odor because the volatile matter is evaporated off.

The witness has found sixty preparations in the U. S. Dispensatory and the National Formulary which contain more alcohol per dose than Wine of Cardui, based on the maximum dosage given in these books. He could not recall how frequently these doses were given.

Dr. Caspari stated that there are many vegetable compounds which cannot be analyzed to determine the preparations from which they are made. He stated that he could not ascertain the ingredients from which Wine of Cardui was made. The results of his analysis were practically the same as those obtained by all the chemists who have testified in the case. In his opinion no chemist could ascertain by chemical analysis what the ingredients of Wine of Cardui are.

Dr. Caspari testified that if a guinea-pig should get 45 drops or the equivalent of 45 drops of Wine of Cardui, the guinea-pig weighing 154 grams, the corresponding dose of Wine of Cardui for a woman weighing 150 pounds would be about two bottles.

An adjournment was taken until 2 o'clock the same day, Wednesday, June 7.

June 7, 1916, Afternoon.

TESTIMONY OF DR. CHARLES E. CASPARI (*continued*)

Court met pursuant to adjournment. Dr. Charles E. Caspari resumed the stand in behalf of the plaintiff.

CROSS-EXAMINATION BY MR. T. J. SCOFIELD

The witness stated that when a preparation is brought to him for analysis he first endeavors to get information as what the preparation is used for and also as to the possible ingredients.

At this point Mr. Hough introduced a correction on the last question asked the witness on direct testimony—namely, addition of the words "without alcohol" in each case as to dosage.

Dr. Caspari stated that any knowledge of the physical properties—the color, odor, and taste of any preparation submitted for examination would be of aid in making such examination. He stated in reference to Wine of Cardui that the word "wine" would suggest that there was alcohol present and the word "cardui" might suggest carduus benedictus. He bought five bottles of Wine of Cardui in the open market. He stated that most chemists are familiar, in a general way, with the therapeutic action of drugs.

The witness again stated his distinction between a chemical analysis and a chemist's report. He stated that there was no fault to find with the results of the chemist's reports published in THE JOURNAL because he found practically the same results himself.

Dr. Caspari stated that magnesium carbonate is added to pills or tablets to make them cohere better. He was asked concerning his criticism of pills offered as defendant exhibits to the effect that they were in a mass and whether or not they would have remained separate if they had been covered with gelatin or with tolu. He stated that the preparation which he examined was not so covered.

The witness stated that there are very few physicians prescribing extemporaneous pills nowadays. Pills prescribed are made by pharmaceutical houses and they are coated. The coating protects the condition of the pill. He stated that the odor of viburnum prunifolium was probably due to some substance in the nature of a glucosid. He stated that he did not know whether the addition of alcohol to the glycerin preparations would produce the odor of the glucosid. The difference in odor between the glycerin extracts and Wine of Cardui is a difference in kind, while the difference in odor between Wine of Cardui and the fluidextract of viburnum prunifolium is rather a difference in degree. He stated that if sufficient alcohol were added it might produce the volatile like odor of the glucosid. There are three or four tinctures and two or three fluidextracts in the Pharmacopeia which contain glycerin.

Dr. Caspari's experience has been that water alone will dissolve very little from viburnum prunifolium. Twenty per cent. alcohol will extract some of the material; 61 per cent. is probably used in the fluid extract to extract all of the material. He has not the faintest idea whether hot water takes out all of the virtues of viburnum prunifolium.

REDIRECT EXAMINATION BY MR. HOUGH

The witness testified that it was impossible for him to state whether the ingredients in the pills or capsules are the same as they were when they were made, or not. It would require a more careful examination than merely looking at them. He stated that the coating of pills would not primarily keep in the volatile matter, but it would depend largely on the character and nature of the volatile matter. He found volatile substances in Wine of Cardui.

The witness stated that glycerin is an alcohol. It is used in certain preparations because that particular combination of glycerin and alcohol has been found the best by experience to extract and preserve that particular drug.

A STATEMENT BY THE COURT

The Court then made the following statement without the presence of the jury:

THE COURT:—It has been represented to the Court that rumors have been spread, by whom it is at this time unimportant, to the effect that various doctors who have testified in this case volunteered in open court the names of their patients. Such rumors are false. All of the doctors, save one from Chicago, who had permission from his patient to disclose her name, requested the Court to allow them to withhold the names of their patients. This request was granted upon condition that the names be given to opposing counsel. As a result, none of the names were mentioned in open court or given to the public, but were given privately to opposing counsel for verification and investigation.

The foregoing statement may be made a part of the record in this case.

An adjournment was taken until Thursday, June 8, 1912, at 10:30 o'clock a. m.

(To be continued)

Correspondence

Federal Aid for Indigent Consumptives

To the Editor:—After twenty-five years of struggle against the menace of the migratory consumptive, California offers a solution in the Kent bill. It is a problem that calls imperatively for solution not only in California, and in the southern and southwestern states and in Colorado, but it constitutes from 5 to 15 per cent. of the tuberculosis situation in the middle states, and in New York and Massachusetts. Every eastern manufacturer suffers immense economic loss from the shifting character of labor, even where the shifting is among the inefficient, and the inefficiency is traced to tuberculosis more than to any other single cause. It is estimated that 10,000 consumptives wander into California every year, filtering through Colorado, Texas, New Mexico and Arizona. Thirty per cent. are indigent when they arrive; 20 per cent. more become so within a year; between 10 and 28 per cent. die within thirty days of arrival, and from 20 to 30 per cent. more within the year, while the percentage who recover or return home is negligible.

Unjust as this burden is, California alone would scarcely have had the temerity to ask for federal help if it had not first exhausted all available efforts at home and been forced to realize that the task was too big and too complicated for a state to handle unaided. The state embargo against the consumptive has been tried and found unworkable. When not unconstitutional, it is truly brutal. Placing the home responsibility on the home state and collecting costs from the home state is not feasible, as the constitution forbids agreements between states (see federal constitution, Article 1, Section 10 and Subdivision 10). Returning indigent patients who so desire is enormously expensive, and if they do not so desire there is no legal way of forcing them. Moreover, this is not necessarily a solution of the case so returned. Local agencies are frequently unable to meet the problem, and the "passing on" method has steadily grown in spite of the efforts of organized charity to prevent it. This has resulted in shifting the load to localities where they are trying to do their duty by their own tuberculosis sufferers. Los Angeles in six months (January 1 to June 30, 1915), had 668 consumptives in her hospital, of whom 145 had been in the county less than six months, while 290 more were adults who had been in the state less than five years.

From the injustice of this burden there is no relief save to bring proper influences to bear on the states and communities whence the patients come and on the transportation companies. To those who had studied the problem for years it seemed obvious that these influences could come only from the federal government. Hence the Kent bill, introduced into Congress by Hon. William Kent of California, and backed by Secretary McAdoo, Surgeon-General Blue and the Public Health Service.

The provisions of the Kent bill are that:

> Any hospital caring for consumptives may apply for 75 cents a day subvention from the federal government for each nonresident consumptive cared for, provided:
>
> (a) That from some source, state, municipal or private, at least 75 cents a day is being spent on his care;
>
> (b) that the care so given satisfies requirements of the Public Health Service who are authorized to visit such hospitals periodically;
>
> (c) that the individual for whom the subvention is sought can show that he is legally a resident of some other state and did not migrate and was not assisted in migration to secure aid under this act.
>
> 2. A consumptive not legally resident in the state where he becomes dependent may, at his request, be returned to his home state by the Public Health Service at government expense, provided:
>
> (a) that he may be adequately cared for in his home state;
>
> (b) and finally, if returned he is not again entitled to any benefit under this act.

It should be noted that by the terms of the bill neither a state, municipality nor private institution need apply for the subsidy if it does not want to, thus obviating any criticism regarding federal interference with state rights. Furthermore, the form of cooperation suggested is a recognized method of dealing with tuberculosis in a considerable number of states. And there is the additional safeguard that the money is administered only on recommendation of the Public Health Service after a hospital has asked for the subsidy and been found to be doing efficient work. Therefore, any criticism based on abuse of *charity* subsidies will encounter this essential difference in a *health* subsidy as contemplated by the Kent bill, namely, that *the source of the subsidy also determines* the conditions and standards according to which it may be granted.

The resulting standardization of tuberculosis hospitals seeking government aid is one of the big features of the bill. Better care of tuberculosis in each state will result from the Public Health Service's jacking up of sanatoriums and the encouraging of new buildings. Foci will be reduced and new cases prevented. "Cures" and "patent medicines" for the tuberculous can be regulated. And, eventually and inevitably, migration will be reduced, because it will put government authority on the fact that climate has never yet cured tuberculosis, and will give wide and effective advertising to this fact.

Furthermore, under the supervision of the Public Health Service, which has undertaken to carry out the provisions of the bill, we may expect the enforcement of the interstate quarantine regulations. The Public Health Service under the secretary of the treasury already has unlimited police power (U. S. quarantine act, 1893), but has never exercised it to the extent made possible by the law. To bring out this full authority requires some crisis such as the plagues in San Francisco and New Orleans or some intolerable burden necessitating federal aid.

This is an interstate problem, and the Public Health Service has the power to deal with tuberculosis as it has also the power to deal with any other quarantinable disease. The secretary of the treasury is authorized to make any regulations necessary to carry out such quarantine. His willingness to accept the responsibility placed on him by this bill is conclusive evidence of his determination to carry out such measures as are proposed by the Kent bill in every state that applies for help where the migratory consumptive has become a local menace. The Kent bill makes the migratory consumptive a national issue and has led the Public Health Service to make a detailed study of the United States interstate quarantine act with a view to more stringent regulations.

PHILIP KING BROWN, M.D., San Francisco.

Epinephrin in Infantile Paralysis

To the Editor:—In the symposium on infantile paralysis which appeared in THE JOURNAL, July 22, there is an error in the reproduction of my remarks (p. 314) which I wish to correct. It reads there: "No death (of infantile paralysis) is usually due to respiratory paralysis." It should read, of course, "Death is usually due to respiratory paralysis."

I shall avail myself of this opportunity to state that in the cases of infantile paralysis treated at the New York Throat, Nose and Lung Hospital, more than fifty babies received an intraspinal injection of 2 c.c. of a 1:1,000 epinephrin chlorid solution every six hours from the very beginning of the disease, that is, as soon as the patients were brought to the hospital. One result stands out clearly: that all these little patients stood *two cubic centimetrs* of epinephrin solution administered intraspinally every six hours for many days without the slightest harm. As to the beneficial results, I prefer, for the present, to make no comment whatsoever.

S. J. MELTZER, M.D., New York.

Meeting of Cremation Society

To the Editor:—The fourth annual convention of the Cremation Association of America will be held in the auditorium of the Hotel Gibson, Cincinnati, Thursday and Friday, August 24 and 25. Physicians who are interested in cremation are invited to attend. They are also eligible to associate membership.

Some of the most eminent members of our profession have been connected with the sanitary reform known as the cremation movement. In Germany it was advocated by

Rudolph Virchow, in England by Sir Henry Thompson and Sir T. Spencer Wells, in France by Dr. Prosper Pietra-Santa, in Denmark by Dr. F. Levison, and in Italy by Drs. Gaetano Pini and M. de Cristoforis. In our own country, Dr. Francis Julius Le Moyne, a graduate of the medical department of the University of Pennsylvania, built the first crematorium in America at his own expense, and cremation was ardently promoted by Drs. Samuel D. Gross, Edward J. Bermingham and Felix Formento.

It will be news to many that the United States has forged ahead of Germany in the leadership of the cremation movement. There are fifty-three crematories here as compared to forty-eight in Germany, and two more are in contemplation, one at Salem, Mass., and another at Kansas City. We have also outdistanced Germany in the total number of incinerations, the figures being 86,006, up to the end of 1913, as compared to 76,350, up to the end of 1915. Statistics recently published in the *Sunnyside* show there was an increase of 906 per cent. in the number of cremations in America in fifteen years.

HUGO ERICHSEN, M.D., Detroit,
President, Cremation Association of America.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

POTASSIUM PERMANGANATE IN RATTLESNAKE BITES

To the Editor:—I was recently asked as to the value of potassium permanganate in rattlesnake bites. 1. What is your opinion? 2. What local measures would you suggest? 3. Are there any serums of value?

F. G. DEWEY, M.D., Coleridge, Neb.

ANSWER.—1. Potassium permanganate is a powerful oxidizing agent, and if applied directly to the open wound will destroy the rattlesnake venom with which it comes in direct contact, practically a very small amount. It is of no value, however, internally, as a sufficient dose to oxidize the venom would kill the individual. See Cushny's "Textbook of Pharmacology and Therapeutics," Lea and Febiger.

2. For rattlesnake, moccasin and copperhead poisoning, no successful antivenoms as yet have been produced. See Kolmer's "Infections, Immunity and Specific Therapy," W. B. Saunders Co., Philadelphia.

3. The most approved local measures in the treatment of snake bites are: free opening of the wound, immediate application of a touriquet to the limb, and the local use of a saturated solution of potassium permanganate.

PRESCRIPTION CONTAINING TARTAR EMETIC AND SODIUM BICARBONATE

To the Editor:—The following prescription is published in a recent journal under the name of a "yaws mixture" and is recommended for kala-azar:

℞	Antimon. et. Pot. Tartr.	gr.	1
	Sod. Salicyl.	gr.	5-10
	Pot. Iodid.	dr.	1
	Sod. Bicarb.	gr.	15
	Aq.	ad. oz.	5

The foregoing is one dose to be given three times a day for adults. Sometimes the potassium iodid has to be reduced to 15 grains.

The main object of the treatment is supposedly the administration of antimony, and I am wondering in what form the antimony occurs in this mixture, and if as a matter of fact it is soluble or, indeed, absorbable. The author states that the mixture is "inelegant owing to the bicarbonate of soda, but this decreases the emetic properties of the mixture." I find that a mixture of a 2 per cent. solution of tartar emetic with a 4 per cent. solution of sodium bicarbonate produces a white precipitate. Perhaps the reason the above-described mixture is not emetic is that the antimony is insoluble. I should be glad of any light that you can throw on the question.

SAMUEL COCHRAN, M.D., Hope Hospital, Hwaiyuan Anhwei, China.

ANSWER.—The foregoing letter was referred to our chemical laboratory, which reports: Tartar emetic and sodium bicarbonate mixed in aqueous solution in the proportions given in the prescription form no immediate precipitate; but on standing some time (for example, over night) a sediment appears on the bottom of the flask. This deposit or precipitate, when filtered off, washed with water and dissolved in hydrochloric acid, gives with hydrogen sulphid the characteristic orange-colored precipitate of antimony sulphid.

In all probability, since there is no immediate precipitation, there is a slight loss of carbon dioxid and resultant increase in hydroxyl ion concentration, permitting hydrolysis of the complex tartrate ion and precipitation of antimony hydroxid.

It is quite likely that the relative insolubility of the antimony compound which is precipitated out by the alkali renders the absorption of antimony slower and in this way decreases its emetic properties."

FRAUDULENT CANVASSERS

To the Editor:—I am enclosing you exhibits which will probably be of interest to you, because they represent, I think, a fraud practiced on members of the medical profession. The gentleman who signed the receipt and took my money claimed to represent the Alumni Educational League, but my letter to the league, asking about the book, which I had paid for, is returned by the postal authorities as unclaimed, with the notation on the back of the envelope that the concern is not known at the address given.

I would appreciate it very much if you could, in any way, trace this concern out, and so would other members of the profession who doubtless gave orders and cash, as I did myself.

The young gentleman claimed to be helping himself to a college education in this way and seemed so familiar with the medical publications, as well as others, that the idea of fraud in connection with it never entered my head.

JAMES V. FREEMAN, M.D., Jacksonville, Fla.

ANSWER.—THE JOURNAL has repeatedly called attention to this scheme. See editorials, THE JOURNAL, April 10, 1915, p. 1247; May 29, 1915, p. 1855; July 31, 1915, p. 434, and Nov. 20, 1915, p. 1825. News items have been published Sept. 4, 1915; Oct. 23, 1915, and an answer in the Queries and Minor Notes Department, Nov. 20, 1915, p. 1837.

R. T. KNIGHT, Pres. GEO. CARLISLE, Vice Pres. L. M. MARTIN, Sec. and Treas.

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ERLENMEYER'S BROMID MIXTURE

To the Editor:—In Current Medical Literature (THE JOURNAL, June 12, 1915, p. 2028), reference is made to the administration of bromid in Erlenmeyer's Mixture. Kindly explain what the mixture is.

H. J. TRESHLER, M.D., Midland, Pa.

ANSWER.—The original article to which our correspondent refers, which was abstracted in THE JOURNAL, is "The Opium-Bromid Treatment of Epilepsy According to Flechsig," by H. G. W. Kellner.

The formula for Erlenmeyer's bromid-water, or mixture, is:

	gm. or c.c.	
Ammonium bromid	1	gr. xv
Potassium bromid		
Sodium bromid	aa 2	gr. xxx
Carbonic acid water (saturated)	600	ʒ xx

According to the original formula of Dr. Erlenmeyer, 1 drop of ammonia water is added to the foregoing formula.

NINE USEFUL DRUGS

Enough replies have been received to the Query on this subject, THE JOURNAL, July 22, 1916, page 309, to indicate that an analysis can be made. However, as a greater number will make such an analysis of interest and value, additional suggestions as to the nine useful drugs to be carried in a physician's handbag will be appreciated.

Medical Education and State Boards of Registration

New Requirements for Licensure in North Dakota

An official report states that at a meeting of the State Board of Medical Examiners of North Dakota held in July, regulations on four special matters were adopted, as follows:

1. The board voted to admit to practice in North Dakota, without further examination, any physician who presents a certificate from the National Board of Medical Examiners showing that he has successfully passed their examination.

2. It was voted that on and after July, 1918, every applicant for license, in addition to graduation from a recognized medical school, must present a certificate showing that he has served one year as an intern in an approved hospital. This applies, therefore, to all graduates of 1917 and thereafter.

3. Beginning January, 1917, every applicant for a license by reciprocity must present a diploma from a college rated in Class A by the Council on Medical Education of the American Medical Association at the time such diploma was granted. The resolution states that this requirement will apply to graduates of 1912 and thereafter.

4. Hereafter no candidate who fails at two examinations will be allowed to write a third time unless he presents a certificate showing that he has spent an additional year either in graduate study or in an approved college or hospital.

North Dakota is the second state to take definite action regarding certificates from the National Board of Medical Examiners, Maryland having done so by legislative enactment a few months ago.

Porto Rico April Report

Dr. M. Quevedo Baez, secretary of the Board of Medical Examiners of Porto Rico, reports the oral and written examination held at San Juan, April 4, 1916. The total number of subjects examined in was 9; total number of questions asked, 90; percentage required to pass, 75. The total number of candidates examined was 6, of whom 3 passed and 3 failed. The following colleges were represented:

PASSED		
College	Year Grad.	Per Cent.
Bennett Medical College	(1915)	79.5
Chicago College of Medicine and Surgery	(1915)	76.5
Rush Medical College	(1915)	76.5
FAILED		
Bennett Medical College	(1915)	68.5
Chicago College of Medicine and Surgery	(1915)	56.5
Tufts College Medical School	(1912)	70.3

The applicant was required to answer ten questions in each of the following subjects (questions in pathology are missing):

DIAGNOSIS

1. Differentiate between cerebrospinal meningitis and anterior poliomyelitis. 2. Describe the symptoms of brain tumor. 3. Give in detail your advice to a young patient in the earliest stage of tuberculosis. 4. Give the causes and symptoms of hemothorax. 5. Mention the cause and symptoms of disease of the coronary arteries. 6. Differentiate cardiac asthma and bronchial asthma. 7. Give etiology and symptoms of arteriosclerosis, and state what conditions of heart, brain and kidney are produced by it. 8. Describe the symptoms present in (*a*) carcinoma of the stomach; (*b*) gastric ulcer; (*c*) duodenal ulcer. 9. Give the probable cause and symptoms of calculus of pancreas. 10. What are the symptoms of acute Bright's disease? 11. Mention some complications which may follow typhoid fever. 12. Give the cause and symptoms of elephantiasis. 13. Describe the prodromal symptoms, giving the duration of each, in (1) scarlet fever; (2) measles, and (3) smallpox. 14. Describe bubonic plague. 15. Give the symptoms and diagnosis of bookworm disease.

GENERAL ANATOMY

1. Give the origin, insertion and action of the rectus femoris. 2. Describe the collateral circulation after ligature of the common carotid artery. 3. Describe the deep palmar arch and give its formation. 4. Describe the knee joint. 5. Describe the arteria femorales as to (*a*) origin, (*b*) course and (*c*) branches. 6. Describe the vena cava inferior. 7. Give the minute anatomy of the lobules of the liver. 8. Give the topographic anatomy of (*a*) the internal abdominal ring and (*b*) the external abdominal ring. 9. Name the ligaments of the hip joint. 10. Name the muscles that flex the thigh, also the leg. 11. What are the divisions of the trifacial nerve? Name the branches of the third division. 12. Describe the shoulder joint. 13. Describe the prostate gland and give its relations. 14. Describe the anatomy involved in an operation for the radical cure of oblique inguinal hernia. 15. Describe the distribution of the peritoneum.

PATHOLOGIC ANATOMY

1. In the study of tumors or growths what macroscopic and microscopic characteristics would lead you to decide in favor of malignancy? 2. Classify tumors. 3. Describe pathologic appearance of acute parenchymatous nephritis. 4. Give the pathology of ophthalmia neonatorum. 5. Give the pathology of dysentery, catarrhal, ulcerative, diphtheritic. 6. What is a sarcomatous tumor? Give its pathology. 7. Mention at least four varieties of ulceration seen in the gastro-intestinal wall. Describe the gross appearance of an amebic ulcer. 8. Describe a tubercle. What is its origin and what tissues are most frequently invaded by it? 9. Give pathologic characteristics of medullary type of carcinoma of the breast. 10. Give gross pathology of endocarditis, and mention most frequent causes. 11. What is the pathologic condition found in chronic Bright's disease? 12. Define hypertrophy, atrophy; give varieties and causes. 13. Give differences between degeneration and necrosis. 14. What is the microscopic appearance of the affected tissues in acute hyperplastic splenitis? 15. How would you distinguish between fatty degeneration and fatty infiltration?

SURGERY

1. Define opsonins, antibodies, embolism, hypospadias and pyelonephrosis. 2. Diagnosis and treatment of posterior dislocation of the hip joint. 3. Treatment of uncomplicated fracture of upper third of the femur. 4. Diagnosis of Pott's disease. 5. Diagnosis of cancer of the female breast. 6. Differential diagnosis of cancer and ulcer of the stomach. 7. Diagnosis of intestinal obstruction. 8. Describe operation of suprapubic cystotomy. 9. Describe the Murphy-Fowler treatment of enterocl ysis. 10. Describe operation for ligature of external carotid. 11. Prophylaxis and treatment of tetanus. 12. Cause, symptoms and treatment of acute noncalculous cholecystitis. 13. Diagnosis of fracture of the base of the skull. 14. Cause and treatment of decubital ulcers. 15. Describe one method of operation for the repair of harelip.

GYNECOLOGY AND OBSTETRICS

1. Define corpus luteum, abortion, menopause, version and placenta praevia. 2. Symptoms of retroversion of the uterus. 3. Diagnosis of extra-uterine pregnancy. 4. Cause and treatment of rupture of the uterus during labor. 5. Diagnosis of R. O. P. before labor. 6. Causes and treatment of retained placenta after full term delivery. 7. Treatment of acute salpingitis. 8. What are the difficulties for delivery in O. P. positions? 9. Name the sutures of the fetal head. 10. Uses of pituitary extract in obstetrics. 11. Give the causes and management of prolapsed cord. 12. Treatment of postpartum hemorrhage due to laceration of the cervix. 13. Describe operation for repair of *complete* laceration of perineum immediately after labor, stating what kind of suture material is used. Mention positive signs of pregnancy. 15. What is meant by currettage of the uterus, and when is it indicated?

THERAPEUTICS AND MATERIA MEDICA

1. Mention five drugs that are chemically incompatible with tannic acid. 2. Mention five saline purgatives and state the dosage of each. 3. What is the chemical antidote for arsenic? Give the dose of this antidote. 4. Creosote: properties, action and uses, dosage. 5. Glycerin: properties, action and uses, dosage. 6. Ichthyol: properties, action and uses, dosage. 7. Give the indications for three remedies useful in metrorrhagia. 8. What are secondary effects of alcohol on stomach, liver, vasomotor system, nervous system? 9. What is the action and dose of apomorphin; of pilocarpin? 10. What is an alkaloid, a tincture, a fluidextract? 11. What is the strength of normal salt solution? Give indications for its use and mode of administration. 12. Give hypodermic dose of strychnin, sulphate of atropin, sulphate of morphin, apomorphin hydrochlorate, nitroglycerin and pilocarpin hydrochlorate. 13. Write a complete prescription for a diuretic containing no less than three ingredients. 14. Potassii chloras: properties, action and uses, dosage. 15. Pulvis effervescens compositus: dosage.

BACTERIOLOGY AND HISTOLOGY

1. Tell in detail: (1) How would you detect malarial organisms in blood; (2) How distinguish between the quartan and estivo-autumnal parasite? 2. Define: toxins, antitoxins, amboceptors, bacterioproteins, lysins. 3. Describe Widal's test for typhoid. What is its diagnostic value? 4. Describe fully the organism recognized as the cause of syphilis. 5. In a suspected case of pulmonary tuberculosis, what laboratory methods should be employed to establish the diagnosis? Give the methods in detail. 6. Describe in detail Gram's method of staining. Mention two species of micrococci that may be distinguished from each other by this method. 7. Describe striped and unstriped muscle, and name organs in which unstriped is found. 8. What is the relative difference between the sympathetic and cerebrospinal fevers? 9. Name the coats of an arteries and give structural difference. 10. Give compositions of human blood. 11. Mention different leukocytes and derivation of names. 12. Give the normal histology of the skin. 13. Explain the difference between active and passive immunity. Illustrate by example how each may be acquired. 14. Give the structure of the mucous membrane of the stomach. 15. What structural differences are there between the malpighian corpuscles of the spleen and those of the kidneys? Make drawings.

PHYSIOLOGY AND HYGIENE

1. What are the manifestations of cell life metabolism? Explain significance and give classification. 2. Name end-products resulting from digestion of the three principal types of food, and explain how and by what channels they enter the circulation. 3. Name the varieties of blood that circulate through the liver. State the source and give the function of each. 4. What changes take place in the composition of blood as it passes through the kidneys? 5. Describe the sounds of the heart and give causes. 6. Discuss fully respiration. 7. State the number of white corpuscles in a cubic millimeter of blood. State the function of white corpuscles. 8. What diseases are specially liable to be conveyed by ingestion of milk? 9. Describe the portal circulation. 10. What are the uses of narcotics? Name the principal ones, giving the doses of each. 11. Suggest the prophylaxis of gastro-enteric toxemia of bottle-fed infants. 12. What is urea? What is the pathologic significance of urea in the urine? How estimated? 13. Discuss the influence of alcohol on the race. Is it food or poison? 14. Is sanatorium treatment of tuberculosis worth while? 15. How dangerous is impure air? How tested? And what would be index of impurity? What hygienic measures should be observed in public schools?

Book Notices

A Treatise on Blood Pressure in Ocular Work. With Special Reference to Factors of Interest to Refractionists. By Eugene G. Wiseman. Cloth. Price, $2.50. Pp. 267, with 19 illustrations. Rochester: John P. Smith Company, 1916.

According to the introduction, the purpose of this book is "to acquaint the optometric profession with a science (sphygmomanometry) hitherto unemployed by it, but one which vitally concerns its future welfare." A careful reading of this book gives one the impression that the foregoing quotation is indeed true; it is hard to believe, however, that the "future welfare" of a certain manufacturer of sphygmomanometers is not also kept well in mind by the author. The volume is written by a nonmedical man, and reflects a lack of scientific knowledge in unfounded assertions and disjointed arguments. The book fills no want in the library of physicians, surgeons or oculists. It contains nothing original; and is simply a review of what has been said by others, with conclusions drawn by the author, attempting to show that all "optometrists," opticians, etc., should equip themselves with a sphygmomanometer (particularly one of a certain make), thereby greatly enhancing their chances for success. The placing of a highly scientific instrument, such as the sphygmomanometer, into the hands of an individual whose training has been only that found in the class referred to above could hardly result in any valuable benefit to the patient. Its most marked function, under these conditions, would probably be its spectacular and psychologic effect on the patient, tending to impress him with the attainments of the examiner.

Infant Mortality: Its Relation to Industrial and Social Conditions. By Henry H. Hibbs, Jr. Paper. Pp. 127. New York: Department of Child-Helping, Russell Sage Foundation, 1916.

This book includes a series of papers representing an investigation of infant mortality conducted by the Boston School for Social Workers under a grant from the Russell Sage Foundation. Certain factors, such as the character of the milk supply, the influence of artificial feeding, and the form of medical attendance, which have received extended discussion elsewhere, are not included in this report, nor has any attempt been made to determine, except roughly, the relative influence of the various factors discussed. Chapters are devoted to the present position of infant mortality and its recent decline in the United States; the influence of prenatal conditions on infant mortality; infant mortality and the size of the family; the mother and infant mortality; and infant mortality, housing conditions, and influence of economic and industrial conditions. The author concludes that the fundamental causes of an excessive rate of infant mortality are poverty, inadequate economics, and low standards of living. The fundamental remedy is higher wages. Other remedies, such as legislation restricting or regulating the employment of mothers before and after confinement, day nurseries, the instruction of mothers and schoolgirls in domestic economy, etc., have their places, but the chief thing remains the provision of an adequate family income.

The Involuntary Nervous System. By Walter Holbrook Gaskell, M.A., M.D., F.R.S. Cloth. Price, $1.80 net. Pp. 178, with illustrations. New York: Longmans, Green & Co., 1916.

The volume represents the results and conclusions of more than thirty years of research on the origin, structure and function of the involuntary nervous system on the part of the late Professor Gaskell. Our present day knowledge of the involuntary nervous system is largely due to the fundamental pioneer work of Gaskell and his pupil, Professor Langley. The problems related to this nervous system are here treated in their widest biologic relations. The book will be of interest to the medical man, despite the fact that it takes no account of the rôle of the involuntary nervous system in disease, such as vagotonia, pluriglandular affections, etc. A clear conception of the biologic relations and rôle of this system in health must ever be the starting point in working out the complex behavior of the system in morbid processes.

Medicolegal

Right of Claimant Against Employer to Sue for Malpractice

(Pavlak vs. Hayes (Wis.), 156 N. W. R. 464)

The Supreme Court of Wisconsin reverses an order which sustained a demurrer to the complaint in this action for alleged malpractice because the plaintiff had made a claim against his employer under the workmen's compensation act. The court says that the plaintiff alleged that, while in the employ of a lumber company, he sustained a fracture of the leg, that he employed the defendant to treat him for the injury, and that by reason of the negligence and lack of skill of the defendant the leg was improperly set and treated, that at the time of the injury both the plaintiff and his employer were under the provisions of the workmen's compensation act, that the plaintiff made a claim against his employer under the act, and received compensation and part of his medical expenses from March 5, the date of the injury to about August 20, that as soon as he discovered the negligence of the defendant he refused to accept any more compensation from his employer, and offered to return the same or so much thereof as the court might adjudicate. The circuit court sustained the demurrer to the complaint on the ground that, when the plaintiff filed a claim against his employer, his cause of action for the injury received and the proximate results thereof were assigned to his employer by virtue of the provision of the compensation act that the making of a lawful claim against an employer for compensation for injury or death of his employee shall operate as an assignment of any cause of action in tort which the employee or his personal representative may have against any other party for such injury or death. But the supreme court says, it is quite evident from a reading of this provision that it contemplates the existence at the same time of two remedies either of which the employee may pursue, as the statutory remedy against his employer or the common law remedy against the third person who by his negligence caused or contributed to his injury, which was not the case here. No duty or opportunity to elect between such remedies could arise until the facts creating the liability of the third person came into existence. In this case they were not known to the plaintiff until about August 20, and there was nothing to show he was negligent in not sooner ascertaining them. As soon as they came to his notice he promptly elected to hold the third person whose alleged negligence aggravated his first injury, and thereby he waived further liability against his employer. It was competent for him to do so, or to hold his employer under the provisions of the compensation act. This act requires the employer to furnish a physician, and makes him liable for the value of the physician's services for not to exceed ninety days. This, the supreme court thinks, implies liability for any aggravation of the injury caused by the negligence of the physician treating the employee during such time. Whether the employer would be liable for malpractice after the expiration of ninety days is not decided. The negligent treatment here was alleged to have begun about two weeks after the accident.

Sunstroke with Reference to Accident Insurance

(Bryant et al. vs. Continental Casualty Co. (Tex.), 182 S. W. R. 673)

The Supreme Court of Texas reverses a judgment rendered in favor of the defendant company, and directs that one be entered for the plaintiffs, on an accident insurance policy which provided that, if sunstroke, due to external, violent and accidental means, should result, independently of all other causes, in the death of the insured within ninety days, the company would pay the principal sum as indemnity for loss of life. The court says that the insured, while walking on the streets of Houston on an unusually warm afternoon in the month of August, in the ordinary course of his occupation as a collector of accounts, suffered a sunstroke from which he died on the following day. The defense of the company was that sunstroke is a disease, and therefore not

an accidental happening; that as a disease it was named as a risk of the policy, and that no indemnity was due for death resulting from it, under the policy, unless the preceding exposure was itself the consequence of an accident. The court regards the question presented as an important one, and has been deeply concerned in its correct decision. No decision of this question by a court of last resort in any jurisdiction was found. There have been certain decisions which announce that sunstroke is a disease. But whatever it may be, technically, it is not regarded as a disease in the popular mind. In the common understanding it is accounted a kind of violent personal injury, from the very idea of sudden and external force carried by the word. If classed by medical authorities as, technically, a disease—as to which it is not improbable that there is a conflict of expert view—to none but an expert medical mind would the provisions of this policy have carried the significance that it was insured against as a disease. To men in general, such as those with whom a company of this kind deals and to whom its policies are issued, whether educated or ignorant, the use of the term in any character of contract, and particularly, the court thinks, in an insurance contract, not generally insuring against death by disease, but against death from accidental injury, would have denoted merely what sunstroke is commonly understood to mean—heat prostration, frequently a casualty, a species of bodily injury, distinct in its kind and individual in its cause, and of known and not unusual occurrence. With the term having, as it does, this recognized popular meaning distinctly different from any technical significance it may possess, the proposition that the latter must prevail in the construction of the policy is not to be allowed.

Duty of the State to Restrain and Confine the Insane

(Hammon vs. Hill (U. S.), 228 Fed. R. 999)

The United States District Court, in Pennsylvania, in denying the petitioner a writ of habeas corpus against the superintendent of the Allegheny County Home and Hospital for the Insane, says that the petitioner based his right to discharge, notwithstanding his insanity, or presumptive insanity, on the unconstitutionality of the act under which he was committed, and that therefore he was restrained of his liberty without due process of law. It appeared that he was restrained and confined in the asylum under and in accordance with the provisions of an act of assembly of the state of Pennsylvania; that this act is one of a number of acts constituting a system adopted by the state for the care of her insane; that the act, or the act to which it is supplementary, has not been declared unconstitutional, or in any respect illegal, by the courts of Pennsylvania; that these acts provide a method by which the sanity of the relator can at any time be judicially determined on his application; that it was not even alleged that at the time of his commitment, or at the time thereof, that he was sane; and it further appearing that his sanity was adjudged by a court of competent jurisdiction on a hearing on a writ of habeas corpus sued out under the act of 1883, this court concludes that he was not restrained in violation of any right guaranteed to him under the Constitution of the United States. Nothing can be clearer than the duty of the state to restrain and confine the insane, not only for their own safety and protection, but also for the safety and protection of the public. The relation between the two is that of guardian and ward. The confinement in an asylum is not of the same character as imprisonment for the punishment of an offense. It is a necessity growing out of the inability of the mentally afflicted to care for themselves or prevent injury to others. The state not only restrains the lunatic for his own protection and the safety of the public, but its duty extends so far as to include every provision known to medical skill and science for the treatment of the diseased mind. Thus the work of the state in caring for the demented within her borders is at once protective in its character and highly humanitarian. A state would indeed be derelict of its duty if it failed to make adequate provision for the care and treatment of the insane. The state is the parens patriae (parent of the country) of the insane.

Society Proceedings

COMING MEETINGS

Colorado State Medical Society, Glenwood Springs, Sept. 5-7.
Michigan State Medical Society, Houghton, Aug. 15-17.
Oregon State Medical Association, Portland, Sept. 9-10.
Utah State Medical Association, Salt Lake City, Sept. 12-13.

AMERICAN ASSOCIATION OF ANESTHETISTS

Fourth Annual Meeting, held in Detroit, June 12, 1916

The President, DR. WILLIS D. GATCH, Indianapolis, in the chair.

Instruction of Medical Students and Hospital Interns in Anesthesia

DR. WILLIS D. GATCH, Indianapolis: Nothing can do more to improve the standing of anesthetists than to educate physicians generally in anesthesia, and the best place to begin is in the medical schools. There is practically no course of instruction on this subject in any of them at present, and state boards of examiners make no requirements in regard to it, with the possible exception of that of Pennsylvania. It may be objected that the curriculum is already overcrowded, but this could be avoided by a proper correlation of subjects. To the objection that not all students need this knowledge after graduation, it may be answered that all should know how to supervise the giving of anesthetics, even if they do not do the actual work. It is not always possible to learn what should be known concerning the various kinds of anesthesia and anesthetics during an internship in a hospital, for not all hospitals employ trained anesthetists.

Why Spinal Anesthesia Fails

DR. W. WAYNE BABCOCK, Philadelphia: Spinal anesthesia involves some technical difficulties. The difficulty in regard to making the puncture properly may now be eliminated as a likely source of trouble, since the performing of lumbar puncture has become so general. The second difficulty is in regard to the solution used. Sometimes the anesthetic is not brought into contact with the nerve roots in sufficient concentration to interrupt their conductivity. With different drugs, the percentage required varies. Another difficulty presented is to select the proper point of injection. The solution should be introduced practically opposite the nerve root that it is desired chiefly to affect. By using solutions varying in specific gravity from that of the cerebrospinal fluid and adopting particular postures with the patient, however, it is possible to cause the solution to gravitate in such a way as to affect nerve roots at a distance from the point of injection. If this is not taken into account, harmful results may be produced. The position of the patient, therefore, is of great importance. Patients who are very nervous are not good subjects for this method. In them, however, spinal anesthesia may be rendered more successful by preoperative medication. Again, the operation sometimes fails because the type of operation is not suited to the method. Unless the time consumed in the operation is short, the patient may emerge from the effects of the drug before the operator has finished. Finally, this method is not adapted to the mental make-up of some surgeons. They must be able to adjust themselves to the peculiar conditions present, to make a success of it. Spinal anesthesia is not the method to be selected in apparently hopeless cases. It should not be employed where a local anesthetic could be used with as great advantage. In patients with great resistance, who can stand a lowered blood pressure, it is possible to secure the most widespread muscular relaxation with complete anesthesia and the least protoplasmic change that can be secured by any method of anesthesia.

DISCUSSION

DR. RAY A. RICE, Columbus, Ohio: We tried spinal anesthesia in the case of a tuberculous patient who was in rather bad shape for taking inhalation anesthetics, on whom we intended to do a leg amputation. Our pathologist prepared

the solution and gave the injection. He used cocain, about 1½ grains to the ounce. The puncture was made successfully on the first attempt. The patient, however, lost none of the ability to feel pain, although we waited for fully fifteen minutes, making trial at intervals. The puncture was evidently made in the proper place, and the fluid came out nicely; but perhaps it did not come from the cord. We had to resort to ether in order to perform the operation.

DR. F. L. RICHARDSON, Boston: I have used tropacocain only, using the side method of injection. I have had only one failure in getting into the spinal canal. I have always made the injection in the lumbar region, depending on the amount of fluid I withdrew to mix with the drug, and the force with which I put it in, to get the height of the anesthesia. I should like to ask whether Dr. Babcock has difficulty in producing anesthesia in persons with a high spinal fluid tension. Of course, the blood pressure varies considerably with spinal anesthesia, and you can control this with gas oxygen.

DR. W. WAYNE BABCOCK, Philadelphia: Sometimes we cannot depend on the solution. In one instance that I know of, a surgeon used it twice in precisely the manner described in an article that I had written, yet in the first case there was no anesthesia produced, while in the second the patient died. I believe that the needle was properly introduced, but it may be that a proper mixture was not made. I have noticed a greater difficulty in the cases of persons with a high intradural tension when the fluid is drawn out with great force. I believe that it is because the solution is apt to leave as soon as the needle is withdrawn. We should take pains, before withdrawing the needle, to see that the solution is thoroughly mixed with the fluid. It is always possible to produce a sufficient degree of anesthesia, if you take this precaution, in from three to five minutes.

Experiments with Magnesium Sulphate

DR. S. J. MELTZER, New York: There have been many investigations on the effect of calcium, potassium and sodium, but not of magnesium, perhaps because the action of this drug is to inhibit, so that it was dismissed as something of no importance. Auer and I have published reports of a large series of experiments with magnesium sulphate, including subcutaneous injections. We found that it depresses the entire nervous system, and even produces anesthesia. Dr. Peck of the Roosevelt Hospital, New York, at my suggestion operated on three men under anesthesia produced by intravenous injections of magnesium sulphate, nothing else being used. They felt no pain, and one of them did not believe that the operation had been performed. That settled the question as to whether real anesthesia is produced by magnesium sulphate or whether it has merely a curare-like effect, which some felt that so long as only animals had been operated on under its influence could not be answered positively. I advise, however, that no one undertake to use this as an anesthetic until we are able to state definitely just how it should be handled. I hope that it will turn out to be an entirely practical method.

DISCUSSION

DR. WILLIS D. GATCH, Indianapolis: When I was an intern, a man was brought to the hospital in a state of coma, produced by his habit of taking 2 or 3 ounces of magnesium sulphate every day. He got over the attack. This was a case of complete magnesium sulphate anesthesia due to taking the drug by mouth, and I have often seen patients who I thought suffered from chronic magnesium sulphate poisoning from taking it in some form or other every day. The only case of severe tetanus that I ever saw saved was saved by intraspinal injections of magnesium sulphate; but I believe that this treatment is dangerous, and should be resorted to only in cases that would otherwise certainly prove fatal.

DR. JAMES T. GWATHMEY, New York: I should like to know the strength of the solution that Dr. Meltzer used for intravenous injection.

DR. S. J. MELTZER, New York: Magnesium sulphate is a very good remedy to apply to burns of the first and second degree. Some years ago, I had fifteen cases of erysipelas in which I used this remedy, and found that the patients were all relieved of the inflammation. I used to think that taking magnesium sulphate by mouth could not produce anesthesia, but two years ago we found that we could kill any animal by injecting it directly into the intestinal canal. I think that in cases of jaundice with pain it might be practical to introduce it into the duodenum by means of the duodenal tube. The pain in these cases is due to colic, two antagonistic muscles contracting at the same time. The fibers of the gallbladder contract and try to force the bile out, while the sphincter of the common duct is also contracting and prevents its escape.

Essence of Orange-Ether Sequence by the Closed Method

DR. I. D. KRUSKAL, Brooklyn: This method overcomes the usual objections to a closed method. It has been used in 1,000 cases without a fatality of any kind. It furnishes a volume of air sufficient for respiration with an amount of anesthetic sufficient to produce anesthesia. Rebreathing of small quantities of carbon dioxid is a means of maintaining cardiac and respiratory function and preventing shock. The patient leaves the table in good condition, and recovery is shorter than by any other method of ether narcosis. There is an absence of prolonged nausea and vomiting. The vapor is constant in strength, moisture and warmth. Ether waste is eliminated. The average time required to get surgical anesthesia is six minutes. This method approaches the ideal more closely than other methods on account of the rapid, pleasant induction, devoid of excitement; the even maintenance, under perfect control, with perfect relaxation, the air supply, sufficient for oxygenation, with partial rebreathing, and the prompt and uneventful recovery.

DISCUSSION

DR. RAY A. RICE, Columbus, Ohio: In my opinion, the open method is very inferior. I now use a semiclosed inhaler drop method of my own to get my patients to sleep; but when they are well relaxed, I switch to an entirely closed method, which is different from Dr. Kruskal's in that I vaporize the ether by passing oxygen through it. It is entirely a rebreathing method. The patient gets no outside air at all, the nasal passages being stopped up. This gives the most perfect anesthesia that I have ever seen. The patient has to be relaxed entirely before the breathing tube is inserted. There is sometimes a coughing and strangling sensation, which the patient does not, of course, know about. I have used this method for a year or more with entire satisfaction. I think that the rebreathing method stimulates respiration and heart action, and prevents shock.

DR. ISABELLA C. HERR, Chicago: Dr. Kruskal gives the average length of induction as six minutes. I give seven minutes as mine. My patients never have coughing or strangling, because I give plenty of air in the beginning, which does not lengthen the time required for giving the anesthetic. If you employ vapor and concentrate it, the patient will hold his breath. You must give enough anesthetic to keep the patient asleep. The operation will regulate the amount needed for this. At certain stages of the procedure, the patient must be kept more soundly asleep than at others. Nausea and vomiting, we might say, are things of the past. We would not average more than 15 per cent. of cases of vomiting with the open method. I have never seen shock produced by an anesthetic. If the patients die, it is not from shock, really, but from paralysis. I have noticed, many times, the rapid breathing which accompanies the rebreathing method. You never see that in the open method of etherization. We do not have excitement, except in alcoholics; but that occurs, regardless of the method which is employed. Of course, Dr. Rice does not give his patients outside air, because it is the oxygen of the air which is required, and they are getting all of that which they require.

DR. CHARLES K. TETER, Cleveland: The success of the anesthesia depends more on the skill of the anesthetist than on the method he may use. Instead of using the nitrogen in the air, I use the oxygen with a small amount of nitrous oxid; and I find that I obtain better results than from just using the oxygen passed through ether. It prevents an overpercentage of carbon dioxid in the breathing mixture. The point of the whole thing is accuracy and constancy of dosage.

DR. L. S. HOLMER, London, Ont.: I should like to ask whether Dr. Kruskal uses preliminary medication, and what lung complications he has with his method in comparison with the open drop method.

DR. WALTER M. BOOTHBY, Boston: It is a mistake to let the teaching go out that ether will not produce lowering of the blood pressure. You can put the patient into a definite surgical shock by this means, if you push the anesthetic too far. The word "shock" has been used a great many times this morning, but I think that the word "collapse" would be better.

DR. JAMES T. GWATHMEY, New York: I do not think that any of us now know which is the better, the open or the closed method. I look on the gas-ether sequence and the drop method as two pioneer methods that should now be methods of the past. The drop method is inaccurate. I have never seen a patient struggle under this method. All my patients have preliminary medication. I think that 2½ ounces of ether in an hour's administration, when absolute relaxation is obtained, cannot be approached by the drop method. I believe the success of Drs. Kruskal and Rice depends on getting the anesthetic well mixed before reaching the patient.

DR. WILLIS D. GATCH, Indianapolis: Do you use a positive intrapulmonary pressure?

DR. I. D. KRUSKAL, Brooklyn: The bag is two thirds distended, so there must be a positive pressure of 8 or 10 mm.

DR. E. J. MCKESSON, Toledo, Ohio: With the bag two thirds distended, the pressure will not run over 3 mm.

DR. M. P. DENTON, New York: I think that 5 mm. would be the proper amount.

DR. CHARLES K. TETER, Cleveland: I have found that with the bag a considerable distance from the patient and with a pressure of 5 mm. in the bag, there was a negative pressure during inhalation. I now take the bag up directly to the inhaler. With a large opening and with 4 mm. of pressure in the bag, the inhalation pressure is 2.5 mm.

DR. F. L. RICHARDSON, Boston: I think that the time is coming when we shall not stick to any one method, but shall select the method adapted to the particular case.

DR. I. D. KRUSKAL, Brooklyn: We can induce anesthesia with gas-oxygen, and then change to ether vapor. I do not see any particular advantage in using oxygen instead of air, except in grave surgical risks. In all cases, I give morphin and atropin, but never scopolamin. I would not go back to any method except a vapor method of ether administration. I think that there is a decided advantage in furnishing definite quantities of ether mixed with air directly to the patient. In regard to the question about pulmonary complications, these were difficult to follow in this series, because many cases were acute surgical conditions. Pulmonary infarcts and emboli occurred in these conditions, but I could not tell whether they were purely postoperative pneumonias or the result of the operation. I realize that open and semi-open ether can be given with satisfaction, and that most of us could, in a simple, ordinary, fifteen minutes' procedure, get as good results with them. I have limited the cases in this paper, however, to grave surgical conditions.

Anesthesia in Epileptics

DR. WALTER H. MYTINGER, Cincinnati: These cases are uniformly difficult to handle. A long preoperative treatment, preferably in an atmosphere conducive to mental rest and physical quiet, is desirable. A hypodermic injection of morphin with atropin has been used in adult cases as a routine procedure. The best results are obtained with this if given one hour and fifteen minutes before the operation. Nitrous oxid would seem to me to be the anesthetic of choice. It is difficult to obtain abdominal relaxation by gas-oxygen, even when nerve blocking is also employed. One must resort freely to the ether attachment; to use chloroform to the extent that might be required would be dangerous. The induction period is prolonged, and one must often wait for a convulsion to subside before taking the patient to the operating room. After administering anesthetics to a number of these patients, one gets the impression that one is giving a double anesthetization. Nearly always, the induction has to be performed twice.

DISCUSSION

DR. GEORGE W. CRILE, Cleveland: I should like to ask how often Dr. Mytinger found convulsions present in his cases before or after induction.

DR. MYTINGER, Cincinnati: It was almost the rule.

DR. F. H. MCMECHAN, Cincinnati: It is interesting to consider whether, in the anesthesia of epileptics of some types, the proper local anesthetic would not solve the problem encountered in the onset of the epileptic seizure during general anesthesia. One of the physicians associated with the Hospital for Epileptics at Gallipolis, Ohio, said that it was the invariable rule that all the patients presented the symptoms of petit or grand mal during the induction stage of anesthesia. She also corroborated the statement that patients become practically anesthetized and ready for operation when the epileptic seizure takes place, and the anesthetic procedure has to be renewed.

(To be continued)

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

Arizona Medical Journal, Phoenix

May, IV, No. 5, pp. 1-22

1 Typhus. C. C. Pierce.
2 Possibility of Preventing Laryngeal Phthisis. S. H. Watson, Tucson.
3 Sociologic Importance of Eyesight. D. F. Harbridge, Phoenix.

Arkansas Medical Society Journal, Little Rock

July, XIII, No. 2, pp. 27-43

4 Nervous Diseases Associated with Pelvic Disorders. G. H. Moody, San Antonio, Texas.
5 Dangers of Pathologic Conditions. R. L. Saxon, Little Rock.
6 Dislocation of Eleventh Dorsal Vertebra; Fracture of Spinous Process Tenth, Eleventh and Twelfth Dorsal Vertebra; Paralysis of Both Legs. J. M. Lemons, Pine Bluff.

Boston Medical and Surgical Journal

July 20, CLXXV, No. 3, pp. 71-112

7 Epidemic Poliomyelitis, Symptomatology and Diagnosis in Acute Stages. F. R. Fraser, New York.
8 Anatomic Form and Posture, Important Factors in Treatment of Pulmonary Tuberculosis. J. E. Goldthwait, Boston.
9 *Teaching of Therapeutics as Branch of Applied Physiology. F. H. McCrudden, Boston.
10 Exfoliative Dermatitis Following Neosalvarsan Injections. R. Bine, San Francisco.
11 Review of One Hundred and Twenty-Seven Clinical Cases of Ataxic Paraplegia. G. H. Bigelow, Boston.

9. Abstracted in THE JOURNAL, March 4, p. 767.

Bulletin of Medical and Chirurgical Faculty of Maryland, Baltimore

July, IX, No. 1, pp. 1-9

12 Artificial Production of Monstrosities. E. R. Stockard, Ithaca, N. Y.

Canadian Medical Association Journal, Toronto

July, VI, No. 7, pp. 577-672

13 *Drugs and Medicinal Agents Considered from Professional, Economic and National Standpoints. A. D. Blackader, Montreal.
14 Surgical Treatment of Gastric and Duodenal Ulcer. A. E. Garrow, Montreal.
15 Operative Treatment of Simple Fractures. E. R. Secord, Brantford.
16 Penetrating Gastric Ulcer with Specimen. E. M. von Eberts, Montreal.
17 Congenital Pyloric Stenosis. Living Case. E. M. von Eberts, Montreal.

13. **Drugs and Medicinal Agents from Professional and National Standpoints.**—The importance of drug therapy is emphasized by Blackader. He says that ailing patients demand some mitigation of their troubles and by means of official drugs, properly employed in proper doses, we are able to give all possible relief. He deprecates the long list of drugs in the Pharmacopeia. In his teaching work he yearly decreases the number of those taught to his students and emphasizes to them the greater importance of knowing a few drugs thoroughly, rather than of knowing many drugs

imperfectly. Large manufacturing houses of limited liability and immense capital, employing a skilled and highly educated staff, have been in many ways of much service to the profession and will be so long as the manufacturers are obliged to maintain a high standard of strength and purity. This, however, will require government supervision. Much caution must be exercised, and an absolute veto be placed on the use of proprietary combinations with patented names, or on any preparations of which the formula is hidden or obscure.

Many of these manufacturing houses and many pharmacists have gone much further than to offer official drugs put up in form convenient for administration, or blended in special formula of their own devising, stated to be suitable for all constitutions and conditions. Many of them now attempt to give advice to physicians as to the latest treatment of disease and foist prescriptions on them containing some so-called new chemical agent—otherwise a well-known drug under a new proprietary name. Still worse, in medical journals, which physicians are supposed to control, proprietary nostrums are ethically (!), so they state, offered only to the profession with highly exaggerated and totally unproved statements, claiming for their special combination all kinds of miraculous powers. Their agents flood us with their free samples and blotters emblazoned with the suggestive names of their special nostrums. Their literature is full of unwarranted statements loudly vaunting the virtues of their specifics; on every page flaunting ready made prescriptions for the physician to copy, in which a valuable official drug is shown in combination with their wonderful "elixir vitae," thus salving the conscience of the physician, while the nostrum manufacturer exacts his heavy toll in the price paid.

All this nostrum and proprietary business, Blockader says, depends on secrecy, on the zeal and assurance of the advertising proprietors, and on the gullibility of the purchaser. "Patent medicines," unless they contain some dope, are short lived. In Blackader's opinion it is reprehensible for the physician to countenance proprietary preparations of even official drugs. Another important fact which has to be recognized today is the number of new synthetic drugs which have been introduced to the profession by German manufacturing houses. A few of these have proved of very definite value, replacing many of our older drugs; the great majority of them, however, have proved failures. For the most part they are the by-products in the manufacture of other chemicals, especially of the anilin dye industry. Chemical industries of Germany have competed with one another for priority rights in flooding the markets of the world with new drugs of almost no value, but with a high sounding proprietary name indicative of their supposed action, to which was attached a scientific name to indicate profound chemical research. In writing prescriptions, Blackader says, avoid the use of all patented names and to use only the name given in the Pharmacopeia, or the chemical name. Much more objectional even than the patented names of new synthetic drugs are the proprietary names representing the semisecret and patented preparations of many large manufacturing drug houses.

Colorado Medicine, Denver

July, XIII, No. 7, pp. 199-230

18 Diabetes Treated by Allen Starvation Method; Report of Seven Cases. T. R. Love, Denver.
19 Rocky Mountain Spotted or Tick Fever. A. J. Campbell, Denver.
20 Influence of Syphilis on Surgery. W. Senger, Pueblo.
21 Inguinal Hernia and Compensation Law. R. W. Corwin, Pueblo.
22 Appendicitis in Children as Still Occasionally Treated. E. Hadley, Telluride.
23 Infections of Hand and Arm. B. B. Blotz, Rocky Ford.

Iowa State Medical Society Journal, Des Moines

July, VI, No. 7, pp. 281-336

24 Arthroplasty from Clinical and Experimental Standpoint. A. Steindler, Iowa City.
25 Pulse Pressure as Measure of Circulatory Efficiency. W. L. Bierring, Des Moines.
26 Abdominal Trauma. O. J. Fay, Des Moines.
27 Vaccine Therapy. G. McConnell, Waterloo.
28 Peroral Endoscopy. F. Roost, Sioux City.

Journal of Abnormal Psychology, Boston

June-July, XI, No. 2, pp. 73-142

29 Doris Case of Quintuple Personality. W. F. Prince.
30 Abnormal Mental States in Children During Convalescence from Acute Illness; Report of Case. J. G. Wilson.

Journal of Biological Chemistry, Baltimore

July, XXV, No. 3, pp. 351-715

31 Influence of Alkali and Alkaline Earth Salts on Rate of Solution of Casein by Sodium Hydroxid. T. B. Robertson and K. Miyake, Berkeley, Calif.
32 *Studies of Autolysis. Latent Period in Autolysis. H. C. Bradley and J. Taylor, Madison, Wis.
33 *Chemical Stimulation of Nerves. J. Loeb and W. F. Ewald, New York.
34 Utilization of Inosite in Dog. R. J. Anderson, New York.
35 *Utilization of Inosite in Animal Organism. Effect of Inosite on Metabolism of Man. R. J. Anderson and A. W. Bosworth, Geneva, N. Y.
36 Nature of Disease Due to Exclusive Diet of Oats in Guinea-Pigs and Rabbits. C. Funk, New York.
37 *Composition and Physiologic Activity of Pituitary Body. II. F. Fenger, Chicago.
38 Rôle of Psychic and Sensory Stimuli in Hyperglycemia Produced by Lowering Environmental Temperature of Dogs. B. Kramer and H. W. Coffin, Iowa City, Iowa.
39 *Nature of Acid Soluble Phosphorus of Serum. I. Greenwald, New York.
40 Chemical Nature of Vitamines. Antineuritic Properties of Hydroxypyridines. R. R. Williams, Washington, D. C.
41 *Studies in Carbohydrate Metabolism. Rôle of Calcium in Regulation of Blood Sugar Content. F. P. Underhill, New Haven, Conn.
42 *Id. Influence of Sodium Carbonate on Blood Sugar Content and on Epinephrin Hyperglycemia and Glycosuria. F. P. Underhill, New Haven, Conn.
43 *Id. Influence of Magnesium Salts on Blood Sugar Content and on Epinephrin Hyperglycemia and Glycosuria. F. P. Underhill, New Haven, Conn.
44 Hydrogen Electrode Potentials of Phthalate, Phosphate and Borate Buffer Mixtures. W. M. Clark and H. A. Lubs, Washington, D. C.
45 Conjugated Sulfuric Acid of Mucin of Pig's Stomach (Mucoitin Sulfuric Acid). P. A. Levene and J. López-Suárez, New York.
46 Cephalin. Phenylureidocephalin and Naphthylureidocephalin. P. A. Levene and C. J. West, New York.
47 Utilization of Sucrose and Inverting Power of Blood Serum After Parenteral Administration of Sucrose. S. Kuriyama, New Haven, Conn.
48 Comparison of Results Obtained by Colorimetric and Gravimetric Determinations of Cholesterol. J. H. Mueller, New York. Influence of Autolysis on Cholesterol Esters. J. H. Mueller.
49 *Studies on Blood Serum. Determination of Noncolloidal Nitrogen. W. H. Welker and F. H. Falls, Chicago.
50 Mechanism of Sparing Action of Carbohydrates on Protein Metabolism. R. A. Kocher, San Francisco.
51 Distribution of Lipoids ("Fat") in Human Blood. W. R. Bloor, Boston.
52 Effect on Nitrogen Partition of Substituting Alcohol for Sucrose in Otherwise Fixed Diet. F. S. Hammett, Los Angeles.
53 Vicine and Divicine. P. A. Levene and J. K. Senior, New York.
54 Preparation of Guanidine Sulfate. P. A. Levene and J. K. Senior, New York.
55 Pituitary Gland, Its Effect on Growth and Fission of Planarian Worms. R. Wulzen, Berkeley, Calif.
56 Experimental Studies on Growth. Influence of Cholesterol on Growth of White Mouse. T. S. Robertson, Berkeley, Calif.
57 Id. Influence of Lecithin on Growth of White Mouse. T. B. Robertson, Berkeley, Calif.
58 Id. Influence of Administration of Egg Lecithin and of Cholesterol to Mother, on Growth of Suckling Mice. T. B. Robertson and E. Cutler, Berkeley, Calif.
59 Improved Hasselbalch Hydrogen Electrode and Combined Tonometer and Hydrogen Electrode, Together with Rapid Methods of Determining Buffer Value of Blood. J. F. McClendon and C. A. Magoon, Minneapolis.

32. **Studies of Autolysis.**—There is nothing in the data presented by Bradley and Taylor which suggests the activation of an enzyme as an important determinative step in autolysis. If the enzyme is activated it takes place at a H plus level such as is found in the living tissue. Furthermore, none of the curves show any indication of an autocatalytic phase in the early stages of the reaction, such as Morse assumed, due to activation of the enzyme by developing acidity. Length of the latent period, rate of proteolysis as measured by concentration of products, and final equilibrium of the digestion all appear to depend on the mass of substratum available for hydrolysis by the proteases present normally in the liver cell.

33. **Chemical Stimulation of Nerves.**—It is shown by Loeb and Ewald that a nonstimulating salt like NH_4Cl can be made a powerful nerve stimulant if for the four hydrogen atoms ethyl groups are substituted. $N(C_2H_5)_4Cl$ is a more powerful stimulant for the nerve than sodium citrate. There is little difference between the stimulating power of the chlorid, hydroxid and citrate of $N(C_2H_5)_4$, showing that in this case the cation and not the anion determines the high stimulating power. This conclusion is supported by the fact that in order to inhibit the stimulating action of the cation $N(C_2H_5)_4$ through the addition of $CaCl_2$ the same high concentration of this latter salt is required as for the inhibition of the stimulating action of sodium citrate. Both $N(C_2H_5)_4Cl$ and Na_3 citrate can only stimulate the nerve when the electric irritability of the latter is at its normal height. If this irritability is only moderately diminished (by putting the nerve for two hours into an isotonic sugar solution), neither sodium citrate nor oxalate nor $N(C_2H_5)_4Cl$ will stimulate the nerve. If, however, the original irritability of the nerve is restored, by bathing the latter in NaCl, sodium citrate as well as $N(C_2H_5)_4Cl$ will stimulate the nerve again.

It can be shown that when enough Ca is added to a solution of $N(C_2H_5)_4Cl$ or Na_3 citrate to inhibit the stimulation, the irritability of the nerve is not lowered. It can be shown that by adding a quantity of Ca not quite high enough to inhibit entirely the effect of the stimulating salts the latent period of stimulation is considerably increased, a fact which harmonizes with the assumption that the inhibiting effect of Ca is due to a prevention or retardation of the diffusion of the stimulating salt into the nerve. All these facts contradict the theory of Mathews that only the anions have a stimulating effect and that Ca (and all the cations), have a depressing effect. Possible explanations of the connection of diffusibility and stimulating action of salts are discussed.

35. **Effect of Inosite on Metabolism of Man.**—When inosite is taken by Anderson and Bosworth at the rate of about 0.5 gm. per kg. of body weight per day it produces some diarrhea at first or frequent soft stools. After a few days the stools, although more frequent than usual, are nearly of normal consistency. Except for the increased excretion of creatinin in the after period, for which Anderson and Bosworth offer no explanation, they find that the ingestion of inosite has no marked or appreciable effect on the general metabolism of man. About 9 per cent. of the inosite taken per os is eliminated unchanged in the urine, but none in the feces. In what manner the balance, or about 91 per cent., of the inosite is utilized the authors have not been able to determine.

37. **Composition of Pituitary Body.**—According to Fenger the physiologic activity of the posterior lobe of the pituitary body is somewhat higher during the growth period than after maturity. This is analogous to the conditions existing in the thyroid, the thymus and the suprarenals. The infant gland contains more phosphates both in the anterior and posterior lobes than glands from fully mature animals. The uterine contracting active principle of the posterior lobe of the pituitary body is readily extracted from the fresh glands by water and also by neutral and acidulated methyl or ethyl alcohol. The acidulated methyl alcohol extract is more than twice as strong as the water extract and somewhat stronger than pure crystalline beta-imidazolylethylamin hydrochlorid.

39. **Acid Soluble Phosphorus of Serum.**—The phosphorus compounds of serum, Greenwald says, consist almost exclusively of phospholipins and inorganic phosphate. There is some indication of the presence of a form which is soluble in dilute acids but is not precipitated by magnesia mixture or by molybdate solution, and which does not dialyze readily from serum.

41. **Calcium in Regulation of Blood Sugar Content.**—Calcium salts, Underhill claims, play a noteworthy rôle in the regulation of blood sugar content, for (1) although an increase of calcium is without marked effect in normal animals such an augmentation in rabbits with a disturbed carbohydrate metabolism, in epinephrin hyperglycemia, may result in a distinct change in the character of the curve of epinephrin hyperglycemia and may also cause a noticeably increased elimination of sugar in the urine; (2) withdrawal of calcium by introduction of sodium phosphate, for example, will produce in normal rabbits, although not invariably, a condition of hypoglycemia; and (3) the injection of epinephrin at an optimum period after sodium phosphate introduction produces a briefer period of hyperglycemia with a lower sugar level than that yielded by epinephrin alone. The sugar elimination by the kidney may also be less than the average output under epinephrin only.

42. **Influence of Sodium Carbonate on Blood Sugar Content.**—Underhill found that the intravenous injections of sodium carbonate into rabbits may induce a marked though transient fall in blood sugar content. It is suggested that the acid base equilibrium is a factor in blood sugar regulation. The significance of this view in its relation to carbohydrate metabolism after thyreoparathyroidectomy is indicated. The hyperglycemia and glycosuria provoked by epinephrin are both significantly decreased if sodium carbonate is administered at suitable periods of time previous to epinephrin introduction.

43. **Influence of Magnesium Salts on Blood Sugar Content.**—Small doses of magnesium lactate introduced subcutaneously, Underhill says, fail to produce significant changes in the blood sugar content of the rabbit. The same dosage of magnesium lactate injected in like manner intensifies the effect of epinephrin on blood sugar content and glycosuria. The maximum influence is seen when the magnesium salt is given two hours previous to epinephrin treatment. A significant hyperglycemia is produced by subcutaneous administration of magnesium sulphate if general anesthesia develops. Glycosuria is always slight. If anesthesia fails to develop, hyperglycemia is not pronounced and is of short duration. Under these conditions sugar fails to appear in the urine. Injection of calcium during the height of magnesium anesthesia quickly abolishes this state, as demonstrated by Meltzer and Auer, and in correspondence with this antagonism there is a rapid return of blood sugar content to the normal level. Glycosuria is either absent or is present to a small degree only. Administration of hydrochloric acid or sodium carbonate is without significant influence on magnesium anesthesia.

49. **Determination of Noncolloidal Nitrogen.**—The results obtained by Welker and Falls show that the nitrogen of urea, glycocoll and leucin can be recovered to a very large extent, and that creatin nitrogen can be recovered only in part by this method. In the experiments on the solution of the noncolloidal products of the tryptic digestion of the serum proteins there is also a failure to recover all the added nitrogen. The results obtained by the use of this method show that not all the noncolloidal nitrogen is determined. They follow closely, however, those obtained by the use of the Folin and Denis method. Aluminium cream is a satisfactory reagent for the removal of the colloidal nitrogen from blood serum. Its use simplifies the determination of the noncolloidal nitrogen of the serum. The liability to experimental error is less than in the method proposed by Folin and Denis.

Journal of Cutaneous Diseases, Boston

July, XXXIV, No. 7, pp. 489-582

60 Peculiar Form of Porokeratosis. S.-I. Matsumoto, Kyoto.
61 Poisoning by Crude Coal Tar. C. J. White, Boston.
62 Diffuse Pigmentation of Scrotum in Lichen Planus. D. W. Montgomery, San Francisco.
63 Verrucae Planae Juveniles Complicated with Lichen Planus. G. D. Culver, San Francisco.
64 Monilethrix; Report of Six Cases. G. M. MacKee and I. Rosen, New York.
65 Histopathology. W. J. Heimann, New York.
66 Preparation of Skin Tissue for Microscopic Study. N. Freeman, New York.

Journal of Pharmacology and Experimental Therapeutics, Baltimore

July, VIII, No. 7, pp. 339-415

67 *Increase of "Tone" Associated with Action of Strophanthus on Heart. J. Tait and H. Pringle, Edinburgh.
68 *Pharmacologic and Chemical Studies on "Senso," the Dried Venom of Chinese Toad. S. Shimizu, Tokyo.

69 *Pharmacology of Novocain. R. A. Hatcher and C. Eggleston, New York.
70 *Influence of Atropin and Pilocarpin on Glycogenic Function. H. McGuigan, Chicago.

67. **Action of Strophanthus on Heart.**—The peculiar slow contraction, sometimes vaguely referred to as "heightened tone," which in the deeply strophanthinised heart precedes the apparent active contractions, being unassociated with any refractory state, according to Tait and Pringle does not involve physiologic activity in the muscle. They agree with Schmiedeberg that the heightened tone is really an increase of elasticity. Roy, dealing specially with the question of elasticity of the heart, could not identify the change produced by digitalis with an increase of elasticity. With Roy's view the authors do agree. They claim that certain peculiarities in the record of a perfused strophanthus-ventricle find their only explanation in the increase of elasticity produced by the drug.

68. **Studies on Senso.**—From "senso," a Chinese drug derived from toad skins, the author has isolated four principles, named preliminarily substances A, B, C and D, only two of which, A and B, have been obtained in a state of chemical purity. Substance A.—At first a crystalline substance was easily obtained, which appeared to be similar to Faust's bufonin and showed a digitalis like action. But the product, after repeated purification, proved itself to be cholesterin, as its melting point and the results of combustion analyses correspond well with those required for cholesterin. Substance B.—This substance occurs in microscopic crystals when obtained from a solution of chloroform and petroleum ether, and appears to be identical (or isomeric) with the bufagin of Abel and Macht as is proved by its physical properties and color reactions and by the results of the elementary analyses. The substance has a marked effect on the heart, causes a rise of the blood pressure and an increased flow of urine, and resembles in its action, on the whole, the digitalis glucosides. However, it produces in almost all cases a distinct "peristalsis" of the frog's heart, and in the warm blooded animals the so-called therapeutic stage is of short duration; even with small doses, a toxic stage may easily occur. Therefore, this substance is of toxicologic interest only, and is quite useless as a therapeutic agent.

Substance C.—This substance, named bufotoxine, possesses a local anesthetic action, and after absorption its action is that of a medullary convulsant poison. It may be classed with the most efficient members of the picrotoxine group. Substance D.—The aqueous solution of "senso" contains epinephrin or an epinephrin like substance, which shows several typical color reactions and, biologically, a strong sympathomimetic action. Owing to lack of material the author is at present unable to isolate this substance in a chemically pure state and to proceed further with an investigation of its various properties.

69. **Pharmacology of Novocain.**—According to Hatcher and Eggleston the toxicity of novocain is greatest when a concentrated solution is injected rapidly into the vein, in which case a dose of 40 mgm. per kilo is fatal to the cat and rabbit, and probably to other animals, though much smaller doses cause severe, and even threatening, symptoms. Very much larger doses may be injected slowly into the vein or subcutaneously without causing more than temporary disturbances. The subcutaneous injection of a mixture of novocain and epinephrin results in greatly delayed absorption and consequently diminished toxicity of the novocain for the cat. When such a mixture is injected intravenously there is a synergistic constrictor action on the vessels, with an antagonistic effect on toxicity probably due to the action of epinephrin on the heart. The toxicity of novocain is increased, but in a variable degree, by the previous administration of hydrated chloral which depresses the respiratory center. The extremes of toxicity of novocain shown when it is injected rapidly into the vein of a chloralized cat (10 mgm. per kilogram, fatal) and when administered slowly to a normal cat (408 mgm. per kilogram with only temporary disturbance), suggest a possible explanation of the accidents occasionally seen when small doses of novocain are used clinically. Novocain leaves the blood stream rapidly, being fixed or destroyed in the liver, the weight of evidence pointing to its destruction in that organ. Less than 3 per cent. (if any) of a large intravenous dose is excreted unchanged in the urine of a cat within a period of two to three hours.

70. **Influence of Atropin and Pilocarpin.**—Large doses of atropin, McGuigan says, usually cause an increase of the blood sugar, probably due to excitement. Pilocarpin in large doses never causes a significant increase of the blood sugar, and often causes a reduction after some hours. The reduction is apparently due to depression and fatigue. The increase in the blood sugar due to ether anesthesia is not modified by atropin or pilocarpin. Atropin in massive doses does not lessen the hyperglycemia due to stimulation of the celiac plexus. The influence of pilocarpin and atropin on the blood sugar furnishes no evidence of the presence of glycosecretory nerves.

Journal-Lancet, Minneapolis

July 15, XXXVI, No. 14, pp. 403-434

71 Semeiotic Significance of Pathologic Findings in Adult Feces. (To be continued.) C. P. Robbins, Winona.

Medical Record, New York

July 15, XC, No. 3, pp. 89-134

72 Recent Progress in Operative Treatment of Empyema of Thorax. H. Lilienthal and M. W. Ware, New York.
73 Cause, Treatment and Prevention of Hay-Fever. W. Scheppegrell, New Orleans.
74 Hair Matrix Carcinoma. F. Warner, Columbus.
75 Action of Gamma Rays of Radium on Deep-Seated Inoperable Cancers of Pelvis. H. Schmitz, Chicago.
76 *Treatment of Paralysis Agitans with Parathyroid Gland. W. N. Berkeley, New York.
77 Wassermann Reaction. B. Lemchen, Dunning, Ill.

July 22, No. 4, pp. 135-176

78 Animal Experiments on Acquirement of Active Immunity by Treatment with von Ruck's Vaccine Against Tuberculosis. F. J. Clemenger, Asheville, N. C., and F. C. Martley, London.
79 Diagnosis and Treatment of Poliomyelitis. W. L. Barber, Waterbury, Conn.
80 Treatment of Unstable Semilunar Cartilages of Knee Joint; Report of Case. R. Whitman, New York.
81 Nature of Leukemias; Pathogenesis of Acute Lymphatic Leukemia. R. Stein, New York.
82 Study of Normal Bacterial Flora of Postage Stamps. R. A. Keilty and P. D. McMaster, Philadelphia.
83 *Value of Scarlet Red in Treatment of Gastric and Duodenal Ulcer. J. Friedenwald and T. F. Leitz, Baltimore.

76. **Treatment of Paralysis Agitans with Parathyroid Gland.**—The preparation used by Berkeley is an acetic extract of the fresh bullock's glands, made by treating the ground or triturated glands with cold distilled water, filtering, and then precipitating with a very minute amount of acetic acid. It is absolutely without local effects of a disagreeable nature. The hypodermic solution, in doses of 15 minims, does not even redden the skin, if it be injected with reasonable care. That parathyroid gland is not a "cure" for paralysis agitans, but 60 to 70 per cent. of the sufferers from this disease who have given the remedy a fair trial for from three to six months have been greatly benefited, and in such patients the progress of the disease has been arrested, or very materially retarded. Berkeley is of the opinion that paralysis agitans is caused by a deficiency of the parathyroid glands, and that further and more diligent study of the complicated chemical processes involved will make it ultimately possible to cure paralysis agitans with parathyroid in just the same way in which cretinism is cured with thyroid.

83. **Scarlet Red in Treatment of Gastric and Duodenal Ulcer.**—From their experience with this remedy in the treatment of cases of peptic ulcer, together with the results in the thirty-seven cases already reported, Friedenwald and Leitz believe they are justified in drawing the following conclusions: 1. Scarlet red still remains a useful adjuvant in the treatment of peptic ulcer and while it cannot by any means replace the usual forms of treatment, when administered in conjunction with them, it adds materially to the

effectiveness of the cure. 2. It is of great help when administered in the ambulatory cases, the effect being even more favorable than the usual remedies, such as bismuth. 3. Inasmuch as scarlet red in no way interferes with the administration of other remedies, such as the alkalies or atropin, these may be administered when indicated at the same time and, in fact, the effect of the combination is at times most beneficial.

Military Surgeon, Washington, D. C.

July, XXXIX, No. 1, pp. 1-110

84 Duties of Medical Supply Officers and Their Methods. H. I. Raymond and E. P. Wolfe, U. S. Army.
85 Operations for Craniocerebral Wounds of Modern Warfare. H. Cushing, Boston.
86 Training of Navy Hospital Corps Man. F. E. McCullough, U. S. Navy.
87 Relapsing Fever. F. Hagler, St. Louis.
88 Messing and Hygiene of National Guard Regiment on Railroad Trip of Six Thousand Miles. C. B. Walls, Ill. N. G.
89 Venereal Diseases in European Armies. E. K. Tullidge, Philadelphia.
90 Trailer Ambulance. H. H. Johnson, U. S. Army.
91 Advisory Committee of Civilian Physicians and Surgeons on Medical Preparedness. F. F. Simpson, Pittsburgh.

New Orleans Medical and Surgical Journal

July, LXIX, No. 1, pp. 1-80

92 Etiology and Pathology of Blood Dyscrasias Associated with Splenomegaly. J. A. Lanford, New Orleans.
93 Blood Dyscrasias Associated with Splenomegaly. J. D. Weis, New Orleans.
94 Blood Dyscrasias Associated with Enlarged Spleen. F. W. Parham, New Orleans.
95 Aids to Suprapubic Prostatectomy. J. Hume and S. Logan, New Orleans.
96 Mucous Colitis and Its Treatment. S. K. Simon, New Orleans.

New York Medical Journal

July 15, CIV, No. 3, pp. 97-144

97 Syphilis of Nervous System. E. D. Bondurant, Mobile, Ala.
98 Vertigo and Seasickness. L. Fisher and I. H. Jones, Philadelphia.
99 Bone Setting and Its Modern Revival. N. D. Mattison, New York.
100 Tubal Sterilization. A. Heineberg, Philadelphia.
101 Military Preparedness and Surgeon. G. N. Kreider, Springfield, Ill.
102 Rubella or German Measles. E. Gray, Berkeley, Calif.
103 Microscope in Dermatology. O. L. Levin, New York.
104 Connellan-King Diplococcus Infection of Tonsil. J. J. King, New York.
105 Mayer's Solution. D. H. Stewart, New York.

July 22, No. 4, pp. 145-192

106 Diagnosis and Treatment of Acute Anterior Poliomyelitis in Preparalytic and Postparalytic Stages. M. N. Neustaedter, New York.
107 Diagnosis and Treatment. A. H. Wright, Toronto, Canada.
108 Analysis of Certain Neurotic Symptoms. C. P. Oberndorf, New York.
109 Percussion in Early Tuberculosis. J. Schneyer, Philadelphia.
110 Salivary Superstitions. H. D. King, New Orleans.
111 Syphilis of Larynx. J. Weinstein, New York.
112 Interperitoneal Adhesions. R. J. Behan and W. A. Nealon, Pittsburgh.
113 Laboratory Aids in Diagnosis of Poliomyelitis. J. B. Neal, New York.

Tennessee State Medical Association Journal, Nashville

July, IX, No. 3, pp. 111-150

114 Principles of Treatment in Nephritis. M. H. Fischer, Cincinnati.
115 One Hundred Cases of Sacral Anesthesia. D. R. Pickens, Nashville.
116 Prevention of Blindness in Tennessee. R. Fagin, Memphis.
117 Subperiosteal Abscess of Antrum of Highmore; Report of Case. A. B. Dancy, Jackson.
118 Professional Ethics. C. E. Reeves, Gainesboro.
119 Immobilization in Treatment of Injuries to Fingers and Toes. J. W. Handly, Nashville.
120 Constipation. B. F. Fyke, Springfield.
121 Suicide. J. W. Stevens, Nashville.

Texas State Journal of Medicine, Fort Worth

July, XII, No. 3, pp. 121-164

122 Report of Committee on Study of Cancer. W. L. Brown, El Paso.
123 Cancer of Cervix Uteri, with Especial Reference to Combination Method of Treatment. S. M. D. Clark, New Orleans.
124 Some Gynecologic Percentages as Applied to Cancer Problem. F. L. Barnes, Houston.
125 Cancer of Uterus; Its Surgical Treatment. D. C. Balfour, Rochester, Minn.
126 Feeding Problem in Infancy. F. P. Gengenbach, Denver.
127 Does Sphenoidal Sinus Occasionally Pulsate? H. B. Decherd, Dallas.

Wisconsin Medical Journal, Milwaukee

July, XV, No. 2, pp. 33-68

128 Harrison Law and Its Relation to Drug Habitues. A. Sherman, Winnebago.
129 Harrison Narcotic Law. W. N. Wells, Madison.
130 Clinical Studies in Diabetes. H. P. Greeley, Waukesha.
131 Rupture of Aortic Aneurysm into Right Pleural Cavity with Death Two Weeks Later. F. H. Munkwitz and L. Jermain, Milwaukee.
132 Case of Pericarditis with Effusion. D. F. Hudek, Milwaukee.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

July 1, II, No. 2896, pp. 1-32

1 *Transplantation of Bone, and Some Uses of Bone Graft. R. Jones.
2 Life History of Ascaris Lumbricoides. F. H. Stewart.
3 Disinfection of Nasopharynx of Meningococcus Carriers by Means of Air Saturated with Chloramine. M. H. Gordon.
4 *Paralysis of Intestine After Resection for Gunshot Injuries. O. Richards and J. Fraser.
5 Postoperative Paralytic Ileus; Report of Case. H. T. Hicks.
6 Treatment of Backward Displacements of Uterus. F. J. McCann.

1. **Transplantation of Bone; Uses of Bone Graft.**—Whatever particular theory of osteogenesis may be the true one, Jones points out that the following points have proved valuable in practice: The area of the graft must be kept scrupulously aseptic, and free from unnecessary blood clot. Adequate blood supply is necessary to the growth of the graft. The graft must be placed in close apposition to raw surfaces of the bone with which it is to unite. The whole region must be kept fixed for a long period for undisturbed organization to take place. The bone graft should be autogenous, and it is better that it should include both periosteum and medulla wherever this is possible, for both these aspects of the bone afford facilities for the growth of new blood vessels. Surgeons should have patience, for union is often delayed, and hasty conclusions that union is not going to take place, and consequent relaxation of strict fixation of the part, may convert a case of delayed union into one of nonunion. After any of these procedures it is essential to fix the limb absolutely to let new vessels grow undisturbed by chance movements, for the idea of the operation is that all the transplanted bits of bone shall become vascularized. As a general rule, the limb should be kept fixed and undisturbed for at least twice the time necessary for union of the same bone in an ordinary simple fracture.

4. **Paralysis of Intestine After Resection.**—Resection of a wounded coil of small intestine, Richards and Fraser say, is sometimes followed by obstruction, the segments of intestine above the union becoming distended, while the segment below remains contracted. In cases operated on within a short time of the receipt of the injury this is probably mainly due to some interference with the nervous mechanism, caused by the injury itself and the resultant shock, and increased by other causes, for example, local peritonitis. In cases operated on after a considerable interval a further cause is that continued obstruction, and consequent septic absorption, render the bowel above incapable of rapid recovery. A case in which this complication has occurred may possibly be saved by a subsequent short circuiting of the affected coil.

Indian Journal of Medical Research, Calcutta

April, III, No. 4, pp. 565-789

7 Dose of Alum for Clarification of Water by Precipitation. J. Morison.
8 Apparatus for Purification of Water for Troops. R. S. C. Brown.
9 Flies and Their Relation to Epidemic Diarrhea and Dysentery in Poona. J. Morison and W. D. Keyworth.
10 Serologic Investigation and Classification of Cholera-Like Vibrios Isolated From Water in Calcutta. E. D. W. Greig.
11 Tree Hole Breeding Anopheles From Southern India: A. (Cellia-diaezisi) Culiciformis, Cogill. S. R. Christophers and K. Chand.
12 Measurement of Degree of Agglutination. W. F. Harvey.
13 Vaccination. W. F. Harvey.
14 Applications of Kinetic Theory of Gases to Vital Phenomena. A. G. McKendrick.

15 Investigation of Epidemic. W. F. Harvey.
16 Contribution to Study of Kala-Azar. J. W. Cornwall and H. M. LaFrenais.
17 Nosema (Nosema Pulicis N. S.) Parasitic in Dog Flea (Ctenocephalus Felis). V. T. Korke.
18 Study of Hemoprotozoa in Portuguese India. F. De Mello and L. J. Braz De Sa.
19 Arneth's Index in Laboratory Rabies. J. W. Cornwall and S. R. Aiyar.
20 Differentiation of Dysentery Bacilli by Their Agglutination Reactions. M. K. Pai and S. R. Krishnan.

Lancet, London

July 1, 11, No. 4844, pp. 1-44

21 *Fate of Patients Who Have Had Stones Removed From Kidney. J. Bland-Sutton.
22 Prevention and Treatment of Cholera. S. M. Cox.
23 *Cause and Nature of Changes Which Occur in Muscle After Nerve Section. J. N. Langley.
24 Diagnosis of Cancer of Stomach. J. A. Lindsay.
25 *Substitute for Peptone and Standard Nutrient Medium for Bacteriologic Purposes. S. W. Cole and H. Onslow.
26 Shockless Operation. P. Lockhart-Mummery.
27 Intestinal Toxins and Circulation. D. T. Barry.
28 Kala-Azar in Soldiers Returning From Malta. G. R. Ward.
29 Abdominoperineal Resection of Rectum by Coffey's Modification of Two Stage Operation. L. C. Panting.
30 Asphyxia From Defective Shipboard Ventilation. G. E. Brooke.
31 Case of Advanced Intra-Abdominal Pregnancy. B. R. Vickers.
32 Annual Report for 1914 of Registrar-General. J. F. W. Tatham.
33 Portable Fracture Box. J. D. Buxton.

21. Prognosis of Stone in Kidney.—The conservation of a disorganized and septic kidney, Bland-Sutton says, exposes patients to the risk of future suffering from recurrent calculi. This entails repeated operations and, finally, removal of the kidney under adverse conditions. Endeavors to save such damaged kidneys are not examples of cautious surgery, but rather glaring instances of surgical timidity. Many patients suffer much discomfort, even misery, from a timid nephrotomy when their best interests demand bold removal of the disorganized kidney. When a kidney is septic, calculous and disorganized, if its companion is normal the diseased kidney should be removed.

23. Muscle Changes After Nerve Section.—The degree to which electric stimulation prevents wasting of the muscles, Langley says, cannot be determined with any accuracy. Experiments on this point were recently made on rabbits by Kato and Langley. The tibial or peroneal nerves were cut on both sides and the paralyzed muscles stimulated on one side with condenser currents. These experiments, while suggesting that contraction delayed the wasting of the muscle, were not definitely in favor of the theory of "disuse atrophy," for in each experiment great wasting of the muscles occurred and the sluggish response to electric stimulation characteristic of denervated muscle was not prevented. Langley concludes that the changes which take place in muscles after nerve sections are not due to absence of contraction, and that the term "disuse atrophy" is a misnomer. It was noticed by Kato and Langley that muscles from about the fourth day after section of their nerves are in a state of continuous fibrillation, namely, the separate muscle fibers contract rhythmically, but with different rhythms; the muscles present a shimmering appearance when viewed by light reflected from their surface. The contractions cause no movements of the muscle as a whole, and are easily overlooked. As each fiber contracts many times the total expenditure of energy in the day must be considerable. Langley believes that it is reasonable to suppose that this continued activity of the muscle fibers must cause fatigue, and that the atrophy of muscle is due to too great rather than to too little functional activity. The changes in reaction which occur in denervated muscle are, in fact, like those caused by fatigue.

25. Substitute for Peptone.—Experiments were made by Cole and Onslow with various mediums containing an abundant supply of amino-acids. The growth on such mediums of a large number of pathogenic organisms is rapid compared with their growth on the recognized standard mediums. The supply of free amino-acids is best obtained by the tryptic digestion of casein, and to procure uniform results a pancreatic extract is used, prepared by a special method described fully in the paper.

Medical Journal of Australia, Sydney

June 3, 1, No. 23, pp. 447-462

34 Cystic Ovaries. W. Ritchie.
35 Case of Coal Gas Poisoning. E. L. Crowther.
36 Right Laryngohemiplegia Following Goiter Operation. Right Abductor Paresis From Pressure of Enlarged Cervical Glands. L. G. Davidson.

June 10, No. 24, pp. 463-478

37 Eighty Cases of Wounds of Head Seen in Base Hospital in France. J. F. Fairley.

June 17, No. 25, pp. 479-496

38 Australian Voluntary Hospital in France. G. Horne.
39 Some Functions of Thyroid Gland and Their Relationship to Goiter. S. Pern.
40 Successful Case of Esophagotomy for Removal of Plate of False Teeth. H. Bullock.
41 History of Small Urinary Calculus. J. B. Nash.

Sei-I-Kwai Medical Journal, Tokyo

June, XXXV, No. 6, pp. 29-34

42 *Investigation of Diabetes Mellitus Among Japanese. S. Iwai.

42. Diabetes Mellitus Among Japanese.—The tolerance of the Japanese for sugar seems stronger than that of the Europeans. The fact that there are more mild forms of diabetes and less severe cases of it among the Japanese, Iwai suggests, may be due to this difference in the tolerance for sugar. Among the Japanese, women seem to have stronger tolerance than men. The fact that there is less diabetes among women than among men may also be due to this stronger tolerance of women, but there is more room for further study in this regard. The excess of starchy food alone cannot make glycosuria in healthy people; this fact may shed light on the fact that there are few diabetics among the Japanese whose chief food is of a starchy nature.

Bulletin de l'Académie de Médecine, Paris

June 20, LXXV, No. 25, pp. 729-758

43 Fatal Tetanus Ascribed to Catgut Used at a Herniotomy. C. Nicolle and H. Bouquet.
44 Necessity for Use of Standardized Vaccine. (Ce que doit être le vaccin animal utilisé pour les vaccinations publiques.) L. Camus.
45 Fresh Milk Favorable Culture Medium for Typhoid Bacilli; Souring Destroys Them. (Nouvelles observations sur le mécanisme de la propagation de la fièvre typhoide par le lait.) A. Trillat.
46 Superposed Typhoid and Paratyphoid. (Les fièvres typhoides intriquées.) A. Chantemesse and A. Grimberg.

Lyon Médical

June, CXXV, No. 6, pp. 177-244

47 *Deficiency Disturbances in Infants. (La carence alimentaire chez l'enfant.) E. Weill and G. Mouriquand.

47. Deficiency Disturbances in Infants. — Weill and Mouriquand remark that quite frequently the dietetic deficiency responsible for the disturbances is the direct result of the physician's advice. The sterilization of milk is carried too far, or the starches are in too fine a form, too thoroughly bolted, and used too exclusively. Deficiency disturbances may develop on breast milk, a fact that has only recently been emphasized. Certain infants do not thrive on certain breast milks even when the milk is seemingly good and abundant. The child may present anemia and fail to develop properly. The manifestations from "deficiency" milk, in the course of breast feeding, are most characteristic in the regions where beriberi prevails. The nursing woman with beriberi may transmit it in a grave form to her nursling. It survives only if a change is made in time to milk that is not of this deficiency type. Even if the nursing woman is still healthy, a too exclusive diet of polished rice may modify her milk in such a way that the nursling feels the deficiency effect and malnutrition results. Neither infection nor intoxication explain such facts. Outside of beriberi regions such extreme types are not known, but they show that the diet of nursing women should not be too exclusive in any line and should include fresh vegetables and fruit, etc.

In regard to artificial food, Weill and Mouriquand state that they have never encountered a case of scorbutus among infants fed on freshly sterilized milk. Even on the commercially sterilized milks and artificial foods it takes months for the child to develop actual scorbutus. It seems as if

it must bring into the world with it a supply of the necessary ferments which it takes long to use up, and a little orange juice, raw meat, etc., rapidly restores the supply. Deficiency disturbances are liable to develop on any cereal hulled too completely, as well as with pod vegetables hulled and sterilized too thoroughly. By adding overbolted starches to the oversterilized milk, the onset of the disturbances is hastened and they are rendered more severe. Weill and Mouriquand have been making a study of deficiency diets since the war began, with a view to warding off all disturbances of the kind from the troops. A long list of their communications presented at meetings of the Société de Biologie in the last two years is appended. The latest ones were entitled "Research on Cats Fed Exclusively on Meat Raw, Frozen, Salted, Boiled or Otherwise Sterilized" and *"Graines de céréales décortiquées hypercarencées par la stérilisation."*

Paris Médical

June 24, VI, No. 26, pp. 581-596

48 War Wounds of the Skull and Their Treatment. (Lésions du crâne par projectiles de guerre.) H. Hartmann.
49 *Importance of Examination and Treatment of Rhinopharynx in Epidemic Meningitis. (Cytodiagnostic de l'adénoïdite postérieure à méningocoque; son rôle dans le diagnostic et le traitement de la méningite cérébro-spinale épidémique.) G. Rosenthal and J. Cheville.
50 Atrophy of Muscles and Deep Hyperesthesia as Signs of Chronic Apical Lesion Below. R. M. Beauchant.
51 The Preceding Condition in Estimating Amount of Pension for the Incapacitated. (De l'état antérieur dans l'appréciation de l'invalidité des militaires.) Granjux.
52 *The Metal Helmet. (L'efficacité de protection du casque d'infanterie.) P. Sollier.
53 *Petrolatum in Treatment of Constipation. (Notes pratiques sur l'emploi de l'huile de vaseline ou de paraffine dans la constipation.) Le Tanneur.

49. Diagnosis and Treatment of Meningitis by Way of the Rhinopharynx.—Rosenthal and Cheville reiterate that epidemic meningitis starts in adenoids—Luschka's tonsil—and hence it can be detected and possibly aborted by examination and treatment of this region. With this specific inflammation, this third tonsil is abnormally hard, and smears show diplococci and associated bacteria with the characteristic débris of blood corpuscles, the polynuclears predominating and very much altered, gram-negative diplococci within and outside of the cells, with scanty epithelial ceils. By means of this cytodiagnosis the disease can be detected in its incipiency and traced into convalescence. If the smear shows numerous epithelial cells and diplococci taking the Gram stain, the probability of epidemic meningitis is slight. As long as the findings are of this characteristic type, there can be no question of convalescence even although the symptoms may have subsided. The pseudoconvalescent is still a menace to himself and the community. The rhinopharynx should be treated with the specific antiserum as well as the meninges. For this they inject daily through the nostrils a medicated oil mixed with equal parts of antimeningococcus serum. The meningococcus adenoiditis, they reiterate, is the primordial and primitive lesion, the fundamental, initial and terminal, substratum of infection with the meningococcus. As long as it persists the patient is infected, not a mere carrier, and specific treatment of the rhinopharynx is indispensable.

52. The Metal Helmet.—Sollier calls attention to the fact that the helmet is a much better protection when it is set on loosely and is not fastened on. When struck by a fragment of shell it yields and is pushed off the head, thus saving the skull much better than when it is held tight by a chin band and is unable to yield at the impact. He also suggests that there should be a space left between the leather inner lining and the metal. This would prevent injury from the sharp edges turned in by the flying shell.

53. Liquid Petrolatum in Constipation.—Le Tanneur points out that a vegetable oil is unable to serve as a lubricant for the feces until the amount ingested surpasses the dose normally saponified by the liver and pancreas. Hence to take olive oil for the purpose, as some recommend, imposes a useless burden on these two organs. Liquid petrolatum, on the other hand, seems to traverse the alimentary canal without exciting any reflex action in the liver. Three years of experience with refined liquid petrolatum have confirmed its valuable lubricating action and its healing influence on the minute excoriations from abnormally hard feces. At necropsy of persons who have been systematically taking liquid petrolatum he has found the appendix literally stuffed with it, and adds that its presence in this way guarantees sterility from the microbian point of view. He orders one or two tablespoonfuls a day, after dinner at night or before breakfast, keeping it up for two or three weeks, repeating the course as needed. The physician must realize, he declares, that in this he has an absolutely marvelous means at his disposal for keeping constipation under control without drastic measures. But he must impress on the patient that it is a course of treatment, aiming at a durable cure in time.

Presse Médicale, Paris

June 22, XXIV, No. 35, pp. 273-280

54 Bacteriologic and Serologic Diagnosis of Associated Typhoid and Paratyphoid. (Les fièvres typhoïdes intriquées. Technique.) A. Chantemesse and A. Grimberg.
55 Indications for Removal of Projectiles in the Lungs. (Les indications de l'extraction des projectiles intra-pulmonaires.) Piéry.
56 Quantitative Evaluation of the Globulins in the Cerebrospinal Fluid. (De la recherche des globulines dans le liquide céphalo-rachidien par les procédés de Nonne-Apelt et de Noguchi-Moore.) V. Demole.

June 29, No. 36, pp. 281-288

57 Epidemic Bacillary Dysentery at Morocco, 1915. G. Boudet.
58 *Tropical Dysentery Found Endemic in Spain. (Les premiers cas de dysenterie tropicale en Espagne.) F. F. Martinez.

58. Tropical Dysentery in Spain.—Martinez has discovered that what is known as tropical dysentery is at home in southern Spain. He has found the histolytic endameba in the stools of persons who had never been out of Spain. Emetin proved as successful in curing such patients as in its record elsewhere. His previous recent research has likewise confirmed the identity of certain affections endemic in southern Spain with leishmaniasis, both kala-azar in children and oriental sore. These supposedly tropical and exotic affections he has thus revealed are endemic in his country.

Correspondens-Blatt für Schweizer Aerste, Basel

June 24, XLVI, No. 26, pp. 801-832

59 *Technic for Measuring the Blood Pressure and Testing the Functional Capacity of the Heart, and Interpretation of the Findings. (Ueber Messung des Arteriendruckes und Prüfung der Herzfunktion.) H. Schulthess.
60 Arrhythmia. H. Ryser. Continued.

59. Testing the Heart and the Blood Pressure.—Schulthess discusses what we can expect to learn from the blood pressure and heart functioning, and extols the improved technic he has worked out for the purpose. He emphasizes that the blood pressure in an artery is the result of cooperation of a large number of factors, representing different conditions and processes in the circulatory apparatus. The more exactly we can measure the minimal and the maximal pressure and the pulse curve as a whole, the better insight we get into these separate factors. In a series of tests, when he applied the pneumatic cuff to the arm, the pressure at which the peripheral pulse was shut off was about 125 mm. mercury in 107 young men and twenty young women, all healthy, and seated. The pressure was found equally high on an average in his patients with heart disease, but very frequently either higher or lower. It is thus impossible, he declares, to set any figure as the normal standard for the pressure or pulse rate. We can speak only of a "normal range," and a single examination is never decisive. He states that with his modification of O. Frank's mirror sphygmograph, it is possible to determine the minimal pressure with precision. In 200 patients he found it averaged 100 mm. mercury. The normal range of about 80 rose to 100 with valvular defects; to 130 with arteriosclerosis, and to 150 with nephritis. Schulthess has also devised a model of the circulation which pumps with a pulse approximating the human pulse, and, as the various factors are under control separately, it helps to explain the human pulse.

He tests the heart action and pulse before and again after the patient has gone quietly up and down one flight of

stairs. Healthy persons show a slightly accelerated heart beat after going up the stairs six times, but the pulse is not affected. When the heart is insufficient, the pulse becomes smaller as the systole is less complete and the amount of blood expelled is less. The heart is mainly responsible for the changes after exercise, and he records the pulse rate and the blood pressure—what he calls the pulse-shutting-off pressure *(Pulssperrdruck)* before the exercise, and each minute afterward for five minutes. When both, starting with normal figures, run up high together, this speaks for nervous overexcitability of an organically sound cardiovascular apparatus. When the pulse rate runs up high while the arterial pressure falls, there is some organic defect, mitral insufficiency or stenosis, possibly otherwise latent.

He warns against letting patients know the figure of their blood pressure. Those with arteriosclerosis are the ones most interested, and they go from one doctor to another and as the various instruments do not always give concordant findings, the patients come to mistrust the physician's statements, and here again, he says, "we physicians have cut into our own flesh." The lower blood pressure from time to time with the same instrument may be from treatment, abuse of iodids with weakening of the heart's energy, or other factor which simulates a deceptive improvement. Schulthess tells his patient merely, "Your blood pressure corresponds to your age, your constitution," or "is high, and we must seek for the reasons of this high pressure and combat them as called for." The arterial pressure is a guide, but not for the patient, only for the physician. In conclusion he emphasizes that the findings by this method of functional tests may reveal the purely functional nature of disturbances and thus be of more practical importance than the discovery of a valvular defect.

Gazzetta degli Ospedali e delle Cliniche, Milan

June 25, XXXVII, No. 50, pp. 785-800

61 Projectile Loose in Pleural Cavity. (Corpi stranieri vaganti nella pleura.) S. Gangi; (Projettile libero nella cavita pleurica diagnosticato radiologicamente.) G. Ceresole.

Policlinico, Rome

June 25, XXIII, No. 26, pp. 805-836

62 Present Status of Military Surgery. (Note sintetiche di chirurgia di guerra.) G. Mafera.

63 Intravenous Serotherapy of Meningococcus Septicemia; Two Cases; Recovery. T. Dal Canton.

Riforma Medica, Naples

XXXII, No. 16, pp. 421-448

64 Technic and Results of Multiple Vaccine. (Sul valore immunizzante del tetravaccine Castellani: tifo + paratifo A + paratifo B + colera.) F. P. Titone.

65 Traumatic Paralysis of Reflex Origin. P. Boveri.

No. 17, pp. 449-472

66 *Tumors Below the Thalamus in the Midbrain. (Sui tumori della regione ipotalamica del cervello intermedio.) S. Livierato and G. F. Cosmettatos.

No. 18, pp. 473-500

67 Heart Neuroses and the War. (Le nevrose di cuore e la guerra.) A. Ceconi.

68 Acute Delirium. (Considerazioni sul delirio acuto.) A. Salerni.

66. **Tumors in Chiasm Region.**—A case with necropsy findings demonstrates anew that the loss of the sense of smell may be a comparatively early symptom of a tumor below the thalamus in the midbrain. The anosmia may aid in locating the tumor. The case reported shows further that the anterior portion of the optic thalmus does not seem to have any definite physiologic significance. Also that a tumor may develop in this region and grow to a large size without injuring the hypophysis, apparently, in any way either anatomically or functionally.

Brazil-Medico, Rio de Janeiro

June 10, XXX, No. 24, pp. 185-192

69 The Reasoning of the Insane. (Raciocinio nos alienados.) H. Roxo. Commenced in No. 23.

June 17, No. 25, pp. 193-200

70 *The Blood in Yellow Fever. (Contribuição ao estudo da hematologia da febre amarella.) E. P. M. Bittencourt.

70. **The Blood in Yellow Fever.**—Merely the conclusions are given here of Bittencourt's thesis. They are based on study of twenty cases. He found the changes noted constant in all the cases, whatever the type of the case. There was always hypoglobulia and the number of whites was much below normal all the time, while the hemoglobin percentage was not much changed or even a little above normal. The blood coagulates unusually fast, and the serum is of a yellow or orange tint. The greater the displacement toward the left of the Arneth blood picture, the more unfavorable the prognosis. The blood reaction bears a certain resemblance to that of typhoid fever.

Grèce Médicale, Athens

February 1 and 15, XVIII, No. 3-4, pp. 5-8

71 *Partial Collapse of Lung Induced by Paraffin. (Traitement chirurgical de la tuberculose pulmonaire par décollement de la plèvre pariétale, et affaissement partiel du poumon, tamponné par la paraffine.) G. Dré Kolias. Commenced in No. 1.

72 *Amebic Dysentery in Greece. (Sur quelques traits de la dysentérie amibienne en Grèce.) I. Cecikas.

71. **Partial Collapse of Lung Induced by Paraffin.**—The first part of Dré Kolias' article was listed in these columns May 13, 1916, p. 1590. He here records the later findings in the case reported, all testifying to the beneficial action of the operation, permitting the lung to collapse, after releasing it from the parietal pleura. The lung was then immobilized to a certain extent by injecting paraffin. He says that Tuffier's operation of decortication of the lung has been done in only twenty cases to date, but the results have been very favorable, while the technic is simple and easy, as Dré Kolias has amply confirmed on the cadaver. The lung can be compressed and immobilized with paraffin when conditions forbid artificial pneumothorax.

72. **Amebic Dysentery in Greece.**—Cecikas relates that in a recent series of amebic dysentery cases, the correct diagnosis was made in only 19 per cent. at first, all the others presenting various other affections, enterocolitis, malaria, a polyp or fistula in the rectum or hemorrhoidal catarrhal trouble. Three of the patients were children, and all were at some summer resort at the time. In all, the reds were far below par, the indican output was increased, and all complained of a vague pain in the abdomen, increasing at defecation, the stools growing more and more numerous, at intervals, the last stool in a series containing blood and pus with more or less mucus. The abdomen showed little change, offering no resistance to ordinary palpation but stiffening, and sharp pain being felt, especially behind the pubis, on the left side, when the hand was worked in deep. Digestion was not much impaired and proctoscopy usually was useful only in that it excluded other affections. In some cases, however, a typical abscess was disclosed. The clinical picture of the amebic dysentery was much milder than is the rule in tropical countries. Persons from the tropics had been stopping at the various hotels where the contagion occurred. The drinking water and the cultivation of vegetables were above suspicion at the places involved. Contagion probably occurred by the water, vegetables or fruits becoming contaminated just before serving—none of those infected had slept in the room with any suspects. The Brazilian ipecac treatment was applied in three cases; the course had to be repeated in one, and a relapse followed a month later. One patient was given the ipecac by the drip technic, but vertigo and vomiting followed with visual disturbances and symptoms of gastro-enteritis. The others were treated with emetin and castor oil with invariably good results.

Acta Scholae Medicinalis Univ. Imp. in Kioto

I, No. 1, pp. 1-133. German Edition

73 *Clinical and Experimental Study of Intracutaneous Resorption. (Die intrakutane Resorption.) M. Kasahara.

74 Biochemical Transformation by Bacteria of the Primary Disintegration Products of Albumin. II. (Ein optisch differenter Abbau des l-Tyrosins durch Proteus bezw. Subtilis.) T. Sasaki.

75 *Experimental Study of Formation of Urine Indican. I-II. (Zur Frage über die Bildung des Harnindikans. I. Fütterungsversuch mit einer grossen Menge Tryptophan; II. Ueber das Verhalten der Phenylglycin-o-carbonsäure im Tierkörper.) C. Asayama.

73. **Absorption of Fluids Injected Into the Skin.**—The hundred pages of Kasahara's report of his experimental work and clinical experiences contain seventy tabulations of details. The data all confirm the slower absorption from within the skin, as the absorbing power is less than just below the skin. But he found that the superficial lymphatics of the corium take up corpuscular elements and bacteria so that intracutaneous injection of bacteria is followed by the signs of positive vaccination earlier and more distinctly than is the case with subcutaneous inoculation, while the local process can be traced and the findings more easily studied. Intracutaneous inoculation is the best method, he states, for enhancing the virulence and testing the toxicity of bacteria, and for differentiating certain strains. When tubercle bacilli are injected into the skin of the guinea-pig a red papule develops which opens spontaneously and becomes transformed into an ulcer which never displays any tendency to heal. The regional lymph glands swell at the same time. These changes occur earlier and in a more pronounced form with intracutaneous than with subcutaneous inoculation. Intracutaneous reinfection of an already tuberculous guinea-pig induces an accelerated reaction at the point of the injection. Normal cerebrospinal fluid induces no reaction when injected into the skin, and thus serves in differentiation of meningitis.

75. **Formation of Urine Indican.**—Asayama fed rabbits with an extract of soy beans and then introduced 1 gm. tryptophan into the stomach through a tube. The urine afterward gave a most striking and pronounced reaction for indican, when before there had been none or merely traces. His tables give the details of these experiments which, he says, have for the first time actually demonstrated the production of urine indican by physiologic means from tryptophan, one of the building-stones of albumin.

Russkiy Vrach, Petrograd

XV, No. 19, pp. 433-456

76 Cardboard Splints for the Shoulder. R. R. Faltin.
77 Improved Pedal Control of Flow of Saline, etc. (Automaticheskiy zazhim v operatsionnoi.) L. I. Omorokoff.
78 Extension Treatment of War Fractures of Femur. M. P. Lavrova.
79 Acute Intestinal Diseases in Soldiers. (K voprosu ob ostrikh zabolievaniakh kishechnago trakta u nizhnikh chinov.) A. V. Lavrinovitch.
80 Influence of Acceleration of Cardiac Contraction on Duration of Period of Impulse Conduction and Systole. (O vlianii uskoreniz serdechnikh sokrashtsheniy na prodolzhitelnost perioda provedenia razdrazhenia i perioda systoli.) N. I. Leporsky.
81 *Electrocardiographic Diagnosis of Nodal Rhythm. A. A. Tardzhimaniants. Commenced in No. 17.

No. 20, pp. 457-480

82 *Vagotony and Sympathotony in Scarlet Fever in Children. V. I. Molchanoff and D. D. Lebedeff.
83 *Poisoning with Asphyxiating Gases. D. I. Vostroff; (Id.) M. D. Toushinsky.
84 Campaign Against Typhus and Recurrent Fever. (O borbie s sipnim i vozvratnim typhami.) V. A. Brink.
85 *Treatment of War Wounds of Rectum. (K liecheniu ognestrielnikh ranenii priamoi kishki.) N. N. Prokhoroff.
86 Intravenous Injections of Iodin Combinations. D. K. Averbukh.

81. **Electrocardiographic Diagnosis of Nodal Rhythm.**—Tardzhimaniants found in a case of myocarditis that digitalis produced nodal rhythm, but atropin stopped it. Adonis vernalis caused nodal rhythm but only transiently. The action of adonis vernalis and digitalis in producing nodal rhythm is thus identical. He declares that the electrocardiographic method of examination is the only one with which an exact diagnosis of this type of rhythm is possible.

82. **Vagotony and Sympathotony in Scarlet Fever in Children.**—Molchanoff and Lebedeff studied the condition of the so-called vegetative nervous system in ten children with scarlet fever, during the period of recovery, the second and third week. The children were from 6 to 12 years old. They injected in turn epinephrin, pilocarpin and atropin, with an interval of from one to three days between them. Before each experiment the blood pressure and pulse were taken, and after the injections both the blood pressure and pulse were determined every fifteen minutes for two or three hours. Epinephrin caused in every patient a rise of blood pressure and acceleration of the pulse, but there was no glycosuria, except quite slight in one patient. Pilocarpin produced a more pronounced reaction, with salivation and sweating, and in three out of ten patients the pulse became accelerated and the blood pressure rose. The atropin effect was less marked, merely dryness of the mouth, dilatation of pupils, and erythema; one patient gave no reaction whatever. The conclusion arrived at is that among the ten little patients eight must be classed as vagotonics; one showed a certain even balance between the vagus and sympathetic systems, and in one case no conclusion could be drawn, as only pilocarpin was tested. The majority of the scarlet fever patients showed in the period of recovery distinct vagotony. They consider the cardiac changes during the period of recovery from scarlet fever (retardation of pulse, arrhythmia, dilatation of heart), and the blood changes (eosinophilia), as manifestations of vagotony, while the so-called white or negative dermographism, which was found in all the ten patients, they consider as a sign of increased tonus of the sympathetic nervous system.

83. **Poisoning with Asphyxiating Gases.**—Vostroff treated 100 soldiers poisoned with asphyxiating gases. The lungs were usually found in a normal condition; emphysema was present in eighteen cases, marked anemia in eight, icterus in one, and dilatation of the heart to the left in two. The blood pressure was usually below normal; with slight lymphocytosis. In addition there was a depressed state of the nervous system, with hypochondria. All recovered with rest and fresh air treatment.

Toushinsky reports a case of gastric ulcer caused by asphyxiating gases three and a half months after the poisoning. The patient had been repeatedly vomiting blood, had blood in the stools, pain after meals, etc. Before the accident there had been no gastric trouble. It is undoubtedly to be ascribed to the action of the poisonous gases.

85. **Treatment of War Wounds of Rectum.**—Prokhoroff obtained excellent results in the treatment of gunshot wounds of the rectum by making an artificial anus. An incision 2 or 3 inches long is made in the left iliac region, parallel to Poupart's ligament, between the umbilicus and the anterior superior iliac spine; the peritoneum is opened, the sigmoid flexure drawn out *ad maximum*, and in its omentum an opening is made with a blunt instrument and a rubber drain tube is introduced. A dressing is then applied without any preliminary sutures on the peritoneum or rectum. The wounds are widely dissected and loosely tamponed. Twenty-four hours later a longitudinal opening of the extracted gut is made for a distance of about 1½ inches. Two days after the operation a large enema of normal salt solution is given through the peripheral end. Two weeks after the operation the patients could be sent to the base hospitals in an excellent condition.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

June 24, I, No. 26, pp. 2329-2420

87 *Operative Treatment of Trigeminal Neuralgia. (Trigeminusneuralgie en de behandeling der hardnekkige gevallen.) L. J. J. Muskens. To be continued.
88 *Heart Disturbances Following Physical Fatigue. (Optreden van hartstoornissen na lichamelijke vermoeienissen.) P. H. Kramer.
89 *School Myopia; Its Origin, Importance and Treatment. (Over de schoolbijziendheid.) W. Koster.
90 Gangrenous Frontal Sinusitis. (Een geval van gangraeneuse ontsteking van den voorhoofdsboezem en etterige ontsteking van de zeefbeencellen met doorbraak naar de oogkuil.) I. C. Henkes.

87. **Operative Treatment of Trigeminal Neuralgia.**—Muskens is privat-docent of neurology at Amsterdam, and he here presents evidence in favor of a method of treating inveterate trigeminal neuralgia as he has accumulated experience with it in the last five years. The first steps of the operation are the same as for gasserectomy, but instead of resecting the gasserian ganglion he crushes with clamps the second and third branches as they leave the ganglion. He says that this causes the cells in the ganglion to atrophy and wither beyond repair, while the operation itself is comparatively harmless. The conditions permit the clamp to be applied at two or three points on the second branch, but

only once on the third. He crushes the axis cylinder as thin as paper, and recuperation and regeneration thereafter seem out of the question. The success was prompt, complete and permanent in three of his five cases with an interval since of four or five years. He gives no case histories in this instalment of his article.

88. **Soldier's Heart.**—Kramer compares the numerous recent publications on heart disturbances in soldiers under the stress of active service with his own experience in Holland with similar disturbances in men after excessive physical exertion. In one of his cases a man of 25 after a long march presented signs and symptoms of mitral regurgitation, accompanied by a feeling of oppression when fatigued. The systolic murmur at the apex and the oppression subsided after a few days of rest, but returned again after fatigue. The left ventricle was found dilated at the time of the murmur but the heart muscle itself seems to be normal in every respect. He explains the disturbance as the result of lack of reserve power. Only the stress of mobilization of the troops revealed this lack of reserve force. Toxic disturbances of the heart action were usually caused by excessive use of tobacco. All complaints of palpitations, irregular pulse, etc., stopped when tobacco was shut off. Cola tablets —taken sometimes by the soldiers as a remedy for sleeplessness—are liable to bring on similar disturbances. The emotions of the campaign, frequent drinking of coffee and tea, abuse of tobacco and concentrated foods whip up thyroid functioning so that many belligerent soldiers are said to suffer from actual hyperthyroidism, an incomplete form of exophthalmic goiter, without exophthalmos or perceptible goiter. This was reported at first as comparatively frequent among the German troops, but Kramer has not encountered among the Dutch troops any cases suggesting this hyperthyroidism. On the other hand, he has seen a number of cases of heart disturbances developing under the strain of the mobilization in young men with a history of comparatively recent typhoid. The postinfectious trouble did not become manifest under the conditions of ordinary life. Under bed rest the murmurs and other symptoms subsided; there was nothing to suggest endocarditis. The murmur at the apex grew louder during inspiration in one of these cases. Grober remarked last year that the soldiers now fighting in the war are liable to develop arteriosclerosis to an unusual extent as one of the pathologic consequences of the war. In conclusion Kramer cites the saying, "The physical heart is doubled by an emotional heart," and declares that the manifold emotions of the war may act directly on the heart. He mentions that Fried reported recently finding the heart much dilated in men who had been fighting in the trenches for some time, without a chance for physical overexertion. He ascribed it to nervous influences alone. Schlesinger has also encountered cases of dilatation of the heart under psychic influences. Half of his 171 "heart cases" were of this type. The number and variety of cardiac neuroses is unprecedentedly large in the present war; most cases of the kind are encountered in the hospitals nearest the firing line. These patients soon improve and in a short time are ready for service again.

89. **School Myopia.**—Koster emphasizes that there are two forms of myopia in children, that which begins when close study is required, about the age of 12 and does not go above 5 D., not increasing any after 16 or 18, and the visual acuity is scarcely reduced. The progressive form begins as early as the fifth year, the visual acuity is reduced and the choroid, ciliary body or iris show manifest signs of something wrong. Between these extreme types there are many transitional cases. Prolonged use of the eyes with the book held too close to the eyes is one factor in school myopia, but hereditary influences he thinks are mainly responsible, an inherited tendency to mild chorioretinitis. The candidates for myopia, even as small children, have comparatively large eyes and somewhat thinner, bluer sclera and deeper anterior chamber. If such children do not happen to do much close work with their eyes, they may escape myopia in school but may develop it later if their trade or business, sewing, watchmaking, etc., makes much demand on the eyes. The cause of myopia he contends is some pathologic condition. With school myopia it is an extremely mild, generally inherited chorioretinitis. The tension with extreme accommodation tends to elongate the axis of the eyeball, which entails the myopia. The latter is merely secondary, and it is a blunder to draw conclusions as to treatment from the standpoint of the laws of optics. The underlying pathologic condition requires treatment and any attempts to improve the myopia must guard against measures liable to conflict with the cure of the primary trouble. His conclusions harmonize, he says, with the views of Donders and van Snellen.

Koster emphasizes further that with school myopia the tendency now is to mistake the effect for the cause and fit glasses to correct the myopia completely, while it is important to avoid excessive accommodation. The glasses should correct the myopia enough for the child to see the blackboard. This will enable him to do all his school work at a distance of ⅓ meter. For close work he takes off the glasses. On the street and doing housework he can wear the glasses or not, as he chooses. Children with beginning school myopia, who cannot be kept from holding the book closer to the eyes, should be given positive glasses of 1 or 2 D. and be warned not to "lie down on their work." The parents must be taught how the child should use the glasses. By this means all demands on the eyes can be met. If the myopia reaches 4 D., then weaker work-glasses can be given, 2 D.; the aim is to prevent excessive accommodation. With myopia gravis, even distance glasses may do harm. Those who insist on glasses to correct completely the defect in refraction, to be worn all day, should stop and realize how much harm they are doing. Treatment should aim to cure the benign chronic chorioretinitis which is the basis of the whole trouble. For this he uses salicylates, mercury or iodids as required, all in minute doses but long kept up, with occasional intermissions. Everything tending to drive the blood into the head should be avoided, no violent gymnastics or exercising with the head bent over, nothing tight around the neck. The child should not be allowed to sit in school with wet or cold feet, and constipation should be combated. No fine handwork of any kind should be allowed, no drawing, and the child should hold himself erect at work and play. By these means the myopia can be kept down within a low range. When it does not surpass 3 D., it is not much of a handicap. It is important to seek out the candidates for myopia and impress on the parents to begin with their younger children to ward off myopia by the above general measures.

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June 14, LIX, No. 24, pp. 569-592

91 *Tuberculous Exanthem Developing Under Radiotherapy of Tuberculous Glands. (Tuberkulöst Exanthem, optrædende som en Dermatitis photoelectrica.) P. Haslund. Concluded in No. 25.

June 28, No. 26, pp. 621-648

92 Recovery Under Salvarsan From Chronic Malaria Refractory to Quinin. (Et Tilfælde af chronisk Malaria behandlet med Salvarsan.) V. Friis-Møller.

93 Hemorrhagic Inherited Syphilis in Two Newly Born Infants. B. Pontoppidan.

91. **Tuberculous Exanthem Developing Under Roentgen Exposures.**—Haslund's patient was a woman of 29 who was being treated at the Finsen Institute for tuberculous glands in the neck. They had gradually enlarged in the course of five years, but without suppuration or perforation, until the circumference of her neck was 37 cm. and the swelling extended on both sides nearly from the ear to the clavicle. Scarcely any local benefit from the Finsen treatment was apparent after six months of exposures but the general health was improved and the patient's acne had entirely subsided. Operative measures were then applied. At the fifth month of the Finsen treatment an eruption developed on the exposed regions and vicinity, new efflorescences constantly developing as long as the exposures were continued, but not afterward. Haslund presents arguments to sustain the assumption that at some time during the treatment tubercle bacilli had found their way from the deep focus to the skin and sensitized it to the chemical rays. The result was what might be called a tuberculous photo-electric dermatitis.